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PRESIDENT, 1911-1912

J. N. SHANNAHAN, VICE-PRESIDENT AND GENERAL MANAGER

NEWPORT NEWS AND OLD POINT RAILWAY AND ELECTRIC CO.

HAMPTON, VA.

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PROCEEDINGS

OF THE

AMERICAN ELECTRIC RAILWAY

TRANSPORTATION AND TRAFFIC ASSOCIATION

American transit operating association/

1912

CONTAINING A COMPLETE REPORT OF THE FIFTH ANNUAL CONVENTION, HELD AT INTERNATIONAL AMPHITHEATRE, CHICAGO, ILL., OCTOBER 7, 8, 9, 10, 1912

PUBLISHED BY THE
AMERICAN ELECTRIC RAILWAY ASSOCIATION
FROM THE OFFICE OF THE SECRETARY
29 WEST 39TH STREET, NEW YORK, N. Y.

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July 2, 1925

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THE AMERICAN STREET AND INTERURBAN RAILWAY TRANSPORTATION AND TRAFFIC ASSOCIATION

WAS ORGANIZED AT NEW YORK, N. Y., JANUARY 30, 1908

THE NAME OF THIS ASSOCIATION IS NOW

AMERICAN ELECTRIC RAILWAY TRANSPORTATION AND TRAFFIC ASSOCIATION

(CHANGE MADE AT 1910 ATLANTIC CITY CONVENTION)

J. B. LYON COMPANY, PRINTERS
ALBANY, N. Y.

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OFFICERS, 1911-1912

(Officers of the 1912 Convention.)

PRESIDENT:
J. N. SHANNAHAN,
Vice-President and General Manager, Newport News & Old Point Railway & Electric Co.,
HAMPTON, VA.

FIRST VICE-PRESIDENT:
DANA STEVENS,
Vice-President and General Manager, The Cincinnati Traction Co.,
CINCINNATI, OHIO.

SECOND VICE-PRESIDENT:
D. A. HEGARTY,
Manager, New Orleans Railway & Light Co.,
NEW ORLEANS, LA.

THIRD VICE-PRESIDENT:
M. C. BRUSH,
Second Vice-President, Boston Elevated Railway Co.,
BOSTON, MASS.

SECRETARY-TREASURER:
H. C. DONECKER,
29 WEST THIRTY-NINTH STREET, NEW YORK, N. Y.

EXECUTIVE COMMITTEE:

THE OFFICERS AND

A. GABOURY, Superintendent, Montreal Tramways Co., Montreal, Que.

C. F. HANDSHY, General Superintendent of Interurban Lines, Illinois Traction System, Springfield, Ill.

C. B. BUCHANAN, General Manager, Virginia Railway & Power Co., Richmond, Va.

H. A. NICHOLL, General Manager, Union Traction Co. of Indiana, Anderson, Ind.

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OFFICERS, 1912-1913

(Elected at the 1912 Convention.)

PRESIDENT;
DANA STEVENS,
Vice-President and General Manager, The Cincinnati Traction Co.,
CINCINNATI, OHIO.

FIRST VICE-PRESIDENT:
D. A. HEGARTY,
Manager, New Orleans Railway & Light Co.,
NEW ORLEANS, LA.

SECOND VICE-PRESIDENT:
M. C. BRUSH,
Second Vice-President, Boston Elevated Railway Co.,
BOSTON, MASS.

THIRD VICE-PRESIDENT:
H. A. NICHOLL,
General Manager, Union Traction Company of Indiana,
ANDERSON, IND.

SECRETARY-TREASURER,
H. C. DONECKER,
29 WEST THIRTY-NINTH STREET, NEW YORK, N. Y.

EXECUTIVE COMMITTEE:

THE OFFICERS AND

C. B. BUCHANAN, General Manager, Virginia Railway & Power Co., Richmond, Va.
W. R. W. GRIFFIN, General Manager, Tri-State Railway and Electric Co., East Liverpool, Ohio.
L. C. BRADLEY, Vice-President, Houston Electric Co., Galveston, Texas.
J. MCMILLAN, General Manager, Pacific Electric Railway Co., Los Angeles, Cal.

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COMMITTEES, 1911-1912

Committee on Subjects

E. C. FABER, *Chairman,* General Manager, Aurora, Elgin & Chicago Railroad Co., Wheaton, Ill.

J. K. PUNDERFORD, General Manager, The Connecticut Co., New Haven, Conn.

L. H. BEAN, Manager, Tacoma Railway & Power Co., Tacoma, Wash.

Committee on City Rules

E. F. PECK, *Chairman,* Vice-President, Newport News & Old Point Railway & Electric Co., Schenectady, N. Y.

J. MCMILLAN, General Manager, Pacific Electric Railway Co., Los Angeles, Cal.

GEO. KUEMMERLEIN, JR., Superintendent Transportation, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

W. A. HEINDLE, Manager Railways, Wilmington & Philadelphia Traction Co., Wilmington, Del.

W. H. GLENN, Manager Railways, Georgia Railway & Electric Co., Atlanta, Ga.

W. B. ROCKWELL, Manager, Eastern Pennsylvania Railways Co., Pottsville, Pa.

Committee on Interurban Rules

C. F. HANDSHY, *Chairman,* General Superintendent Interurban Lines, Illinois Traction System, Springfield, Ill.

F. A. BOUTELLE, Superintendent Transportation, Tacoma Railway & Power Co., Tacoma, Wash.

W. H. COLLINS, General Manager, Fonda, Johnstown & Gloversville Railroad, Gloversville, N. Y.

ALEXANDER SHANE, General Manager, Indianapolis, Columbus & Southern Traction Co., Columbus, Ind.

J. J. DOYLE, General Manager, Washington, Baltimore & Annapolis Electric Railroad Co., Baltimore, Md.

G. H. CLIFFORD, Vice-President and General Manager, Northern Texas Traction Co., Fort Worth, Tex.

Committee on Express and Freight Traffic

H. E. REYNOLDS, *Chairman,* Assistant General Manager, Bay State Street Railway Co., Boston, Mass.

G. W. QUACKENBUSH, Traffic Manager, Illinois Traction System, Springfield, Ill.

F. W. COEN, Vice-President and General Manager, Lake Shore Electric Railway Co., Sandusky, Ohio.

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Committee on Express and Freight Traffic — *Continued:*

A. R. PIPER, General Freight Agent, Brooklyn Rapid Transit Co., Brooklyn, N. Y.

F. D. NORVIEL, General Passenger and Freight Agent, Union Traction Co. of Indiana, Anderson, Ind.

J. C. CALISCH, Vice-President, Buffalo & Lake Erie Traction Co., Buffalo, N. Y.

Committee on Construction of Schedules and Time-Tables

W. R. W. GRIFFIN, *Chairman*, General Manager, Tri-State Railway & Electric Co., East Liverpool, Ohio.

J. E. DUFFY, Superintendent, Syracuse Rapid Transit Railway Co., Syracuse, N. Y.

R. E. LEE, General Superintendent, Cincinnati Traction Co., Cincinnati, Ohio.

C. F. HEWITT, Vice-President and General Manager, Des Moines City Railway Co., Des Moines, Iowa.

A. D. SCHINDLER, General Manager, Northern Electric Railway Co., San Francisco, Cal.

C. E. MORGAN, General Superintendent, Michigan United Traction Co., Jackson, Mich.

T. F. GROVER, General Manager, Terre Haute Division, Terre Haute, Indianapolis & Eastern Traction Co., Terre Haute, Ind.

Committee on Fares and Transfers

T. C. CHERRY, *Chairman*, General Manager, Annapolis Short Line Railway, Baltimore, Md.

F. T. WOOD, Assistant to General Manager, New York Railways Co., New York, N. Y.

J. V. SULLIVAN, General Supervisor, Chicago Railways Co., Chicago, Ill.

J. J. DEMPSEY, Superintendent Elevated Lines, Brooklyn Rapid Transit Co., Brooklyn, N. Y.

J. J. JOHNSON, Assistant General Manager, Oklahoma Railway Co., Oklahoma City, Okla.

E. C. DEAL, Manager, Augusta & Aiken Railway Co., Augusta, Ga.

Committee on Passenger Traffic

J. STANLEY MOORE, *Chairman*, General Passenger Agent, Syracuse, Lake Shore & Northern Railroad Co., Syracuse, N. Y.

F. G. BUFFE, Manager Publicity, The Illinois Traction System, Peoria, Ill.

J. E. GIBSON, General Superintendent, Kansas City Railway & Light Co., Kansas City, Mo.

FRANK CAUM, General Manager, Scranton Railway Co., Scranton, Pa.

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Committee on Passenger Traffic — *Continued:*

N. W. BOLEN, Superintendent Transportation, Public Service Railway Co., Newark, N. J.

J. L. ADAMS, Assistant to President, Philadelphia & Western Railway Co., Upper Darby, Pa.

Committee on Training of Transportation Employees

R. E. DANFORTH, *Chairman*, General Manager, Public Service Railway Co., Newark, N. J.

BRUCE CAMERON, Superintendent Transportation, United Railways Co. of St. Louis, St. Louis, Mo.

M. J. FERON, General Superintendent of Transportation, Metropolitan West-Side Elevated Railway Co., Chicago, Ill.

C. B. WELLS, Superintendent Transportation, The Denver City Tramway Co., Denver, Colo.

C. S. KRICK, Superintendent, Pennsylvania Tunnel & Terminal Railroad Co., New York, N. Y.

C. E. LEARNED, Superintendent of Inspection, Boston Elevated Railway Co., Boston, Mass.

Maj. J. T. CRABBS, Superintendent Transportation Department, Brooklyn Rapid Transit Co., Brooklyn, N. Y.

Special Committee to Develop Uniform Definitions for Terms Commonly Used in the Transportation Department

M. C. BRUSH, *Chairman*, Second Vice-President, Boston Elevated Railway Co., Boston, Mass.

W. C. CALLAGHAN, Superintendent Transportation, City Lines, New York State Railways, Rochester, N. Y.

I. H. MCEWEN, Superintendent, Oneida Railway Co., Utica, N. Y.

A. BENHAM, Assistant General Manager, The Ohio Electric Railway Co., Dayton, Ohio.

Committee on Membership

H. A. NICHOLL, *Chairman*, General Manager, Union Traction Co. of Indiana, Anderson, Ind.

H. E. REYNOLDS, Assistant General Manager, Bay State Street Railway Co., Boston, Mass.

P. P. CRAFTS, General Manager, Iowa & Illinois Railway Co., Davenport, Ia.

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JOINT COMMITTEES

ACCOUNTANTS' AND TRANSPORTATION AND TRAFFIC ASSOCIATIONS

Express and Freight Accounting

ACCOUNTANTS

J. C. COLLINS, *Co-Chairman,* Secretary and Auditor, New York State Railways, Rochester, N. Y.
E. L. KASEMEIER, Auditor, The Ohio Electric Railway Co., Springfield, Ohio.
WALTER SHROYER, Auditor, Union Traction Co. of Indiana, Anderson, Ind.

TRANSPORTATION AND TRAFFIC

J. K. CHOATE, *Co-Chairman,* General Manager, Otsego & Herkimer Railroad Co., Cooperstown, N. Y.
G. H. HARRIS, Manager of Railway Department, Birmingham Railway, Light & Power Co., Birmingham, Ala.
E. C. SPRING, Lehigh Valley Transit Co., Allentown, Penn.

Statistical Unit for Car Operation

ACCOUNTANTS

C. H. LAHR, *Co-Chairman,* Auditor, Northern Ohio Traction & Light Co., Akron, Ohio.
E. L. KASEMEIER, Auditor, Ohio Electric Railway Co., Springfield, Ohio.
C. S. MITCHELL, Auditor, Pittsburgh Railways Co., Pittsburgh, Pa.

TRANSPORTATION AND TRAFFIC

C. B. BUCHANAN, *Co-Chairman,* General Manager, Virginia Railway & Power Co., Richmond, Va.
NATHAN H. DANIELS, JR., with Stone & Webster Management Association, Boston, Mass.
J. A. EMERY, with Ford, Bacon & Davis, New York, N. Y.

Committee on Prepayment Car Operation

COMMITTEE OF ACCOUNTANTS' ASSOCIATION
ACTING WITH COMMITTEE ON FARES AND TRANSFERS

M. R. BOYLAN, *Co-Chairman,* General Auditor, Public Service Railway Co., Newark, N. J.
H. J. DAVIES, Treasurer, The Cleveland Railway Co., Cleveland, Ohio.
C. N. HUGGINS, Treasurer and Assistant Secretary, Portland Railway, Light & Power Co., Portland, Ore.

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ENGINEERING AND TRANSPORTATION AND TRAFFIC ASSOCIATIONS

Block Signals for Electric Railways

ENGINEERS

J. M. WALDRON, *Chairman,* Signal Engineer, Interborough Rapid Transit Co., New York, N. Y.

C. H. MORRISON, Signal Engineer, New York, New Haven & Hartford Railroad, New Haven, Conn.

JOHN LEISENRING, Signal Engineer, The Illinois Traction System, Springfield, Ill.

TRANSPORTATION AND TRAFFIC

C. D. EMMONS, *Vice-Chairman,* General Manager, Chicago, South Bend & Northern Indiana Traction Co., South Bend, Ind.

B. E. MERWIN, General Superintendent, Aurora, Elgin & Chicago Railroad Co., Wheaton, Ill.

C. F. CONN, Vice-President and General Manager, Lackawanna & Wyoming Valley Railroad Co., Scranton, Penn.

Train Operation

ENGINEERS

H. H. ADAMS, *Co-Chairman,* with Ford, Bacon & Davis, New York, N. Y.

H. A. BENEDICT, Mechanical Engineer, Public Service Railway Co., Newark, N. J.

JOHN LINDALL, Superintendent of Rolling Stock and Shops, Boston Elevated Railway Co., Boston, Mass.

F. J. STEVENS, Superintendent of Motive Power, Fort Wayne & Northern Indiana Traction Co., Fort Wayne, Ind.

TRANSPORTATION AND TRAFFIC

W. H. SAWYER, *Co-Chairman,* with Ford, Bacon & Davis, New York, N. Y.

P. N. JONES, General Superintendent, Pittsburgh Railways Co., Pittsburgh, Pa.

R. A. CRUME, General Manager, Dayton & Troy Electric Railway Co., Tippecanoe City, Ohio.

M. D. KILBRIDE, Superintendent Transportation, Interurban Lines, New York State Railways, Rochester, N. Y.

CLAIM AGENTS' AND TRANSPORTATION AND TRAFFIC ASSOCIATIONS

Committee of Claim Agents' Association

ACTING WITH COMMITTEE ON TRAINING OF TRANSPORTATION EMPLOYEES

H. V. DROWN, *Chairman,* General Claim Agent, Public Service Railway Co., Newark, N. J.

P. C. NICKEL, Claim Agent, New York Railways Co., New York, N. Y.

R. E. MCDOUGALL, Claim Agent, New York State Railways, Rochester, N. Y.

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PRESIDENTS OF THE ASSOCIATION SINCE ORGANIZATION

1907–1908	C. Loomis Allen.
1908–1909	C. Loomis Allen.
1909–1910	Robert I. Todd.
1910–1911	Henry C. Page.
1911–1912	J. N. Shannahan.

CONVENTIONS OF THE ASSOCIATION SINCE ORGANIZATION

1908	Atlantic City, N. J.	October 12–15.
1909	Denver, Colo.	October 4–7.
1910	Atlantic City, N. J.	October 10–13.
1911	Atlantic City, N. J.	October 9–12.
1912	Chicago, Ill.	October 7–10.

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OFFICERS SINCE ORGANIZATION

OFFICERS, ORGANIZATION MEETING

(American Street and Interurban Railway Transportation and Traffic Association.)

Chairman:
HON. W. CARYL ELY,
President, Ohio Valley Finance Co., Buffalo, N. Y.

Secretary:
BERNARD V. SWENSON,
Secretary and Treasurer, American Street and Interurban Railway Association, 29 West 39th Street, New York, N. Y.
Elected at New York, N. Y., January 30, 1908.

OFFICERS, 1907-1908

President:
C. LOOMIS ALLEN,
Vice-President and General Manager, Utica & Mohawk Valley Railway Co., Utica, N. Y.

First Vice-President:
ROBERT I. TODD,
Vice-President and General Manager, Indianapolis Traction & Terminal Co., Indianapolis, Ind.

Second Vice-President:
GEO. L. RADCLIFFE,
Superintendent Schenectady Railway Co., Schenectady, N. Y.

Third Vice-President:
A. W. WARNOCK,
General Passenger Agent, Twin City Rapid Transit Co., Minneapolis, Minn.

Secretary and Treasurer.
BERNARD V. SWENSON,
29 West 39th Street, New York, N. Y.

EXECUTIVE COMMITTEE:
The Officers and
G. W. Parker, General Express and Freight Agent, Detroit United Railway, Detroit, Mich.
H. C. Page, General Manager, Springfield Street Railway Co.....Springfield, Mass.
N. W. Bolen, Superintendent of Transportation, Public Service Railway Co., Newark, N. J.
H. A. Davis, Superintendent Railway Department, Nashville Railway and Light Co. Nashville, Tenn.
Elected at New York, N. Y., January 30, 1908.

OFFICERS, 1908-1909

President:
C. LOOMIS ALLEN,
Vice-President and General Manager, Utica & Mohawk Valley Railway Co., Utica, N. Y.

First Vice-President:
ROBERT I. TODD,
Vice-President and General Manager, Indianapolis Traction & Terminal Co., Indianapolis, Ind.

Second Vice-President:
GEO. L. RADCLIFFE,
Superintendent Schenectady Railway Co., Schenectady, N. Y.

Third Vice-President:
A. W. WARNOCK,
General Passenger Agent, Twin City Rapid Transit Co., Minneapolis, Minn.

Secretary and Treasurer:
BERNARD V. SWENSON,
29 West 39th Street, New York, N. Y.

EXECUTIVE COMMITTEE:
The Officers and
G. W. Parker, General Express and Freight Agent, Detroit United Railway, Detroit, Mich.
H. C. Page, General Manager, Springfield Street Railway Co.....Springfield, Mass.
N. W. Bolen, Superintendent of Transportation, Public Service Railway Co..Newark, N. J.
H. A. Davis, Superintendent Railway Department, Nashville Railway & Light Co. Nashville, Tenn.
Elected at Atlantic City, N. J., October 15. 1908.

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OFFICERS, 1909-1910

President:
ROBERT I. TODD,
Vice-President and General Manager, Indianapolis Traction & Terminal Co., Indianapolis, Ind.

First Vice-President:
H. C. PAGE,
General Manager, Worcester Consolidated Street Railway Co., Worcester, Mass.

Second Vice-President:
N. W. BOLEN,
Superintendent of Transportation, Public Service Railway Co., Newark, N. J.

Third Vice-President:
G. W. PARKER,
General Express and Freight Agent, Detroit United Railway, Detroit, Mich.

Secretary and Treasurer:
H. C. DONECKER,
29 West 39th Street, New York, N. Y.

EXECUTIVE COMMITTEE:
The Officers and
J. N. Shannahan, Vice-President and General Manager, Washington, Baltimore & Annapolis Electric Railway Co.....Baltimore, Md.
Dana Stevens, Vice-President and General Manager, The Cincinnati Traction Co. Cincinnati, Ohio
J. W. Brown, Superintendent of Transportation, West Penn Railways Co. Connellsville, Pa.
A. H. Mackay, General Traffic Manager, Tacoma Railway & Power Co. Tacoma, Wash.

Elected at Denver, Colo., October 7, 1909.

OFFICERS, 1910-1911

President:
H. C. PAGE,
General Manager, Worcester Consolidated Street Railway Co., Worcester, Mass.

First Vice-President:
J. N. SHANNAHAN,
Railway Manager, J. G. White & Co., Inc., New York, N. Y.

Second Vice-President:
C. E. LEARNED,
Superintendent of Inspection, Boston Elevated Railway Co., Boston, Mass.

Third Vice-President:
DANA STEVENS,
Vice-President and General Manager, The Cinicinnait Traction Co., Cincinnati, Ohio.

Secretary-Treasurer:
H. C. DONECKER,
29 West Thirty-ninth Street, New York, N. Y.

EXECUTIVE COMMITTEE.
The Officers and
C. D. Emmons, General Manager, Chicago, South Bend & Northern Indiana Railway Co. .....South Bend, Ind.
J. V. Sullivan, General Supervisor, Chicago Railways Co.....Chicago, Ill.
J. W. Glendening, Treasurer, General Freight and Passenger Agent, Saginaw-Bay City Railway Co. .....Bay City, Mich.
A. Gaboury, Superintendent, Montreal Street Railway Co.....Montreal, Que.

Elected at Atlantic City, October 13, 1910.

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CONVENTION PROGRAM

(Chicago, Illinois, October 7, 8, 9 and 10, 1912.)

MEETING ROOMS

(All Regular Sessions and Joint Sessions with Accountants and Claim Agents Associations in the Blue Room, Saddle and Sirloin Club.)
(Joint Session with Engineering Association in the Brown Room, Saddle and Sirloin Club.)

Monday, October 7th — 9.30 A. M. to 12.30 P. M.

Registration and Badges. Convention Hall, International Amphitheatre.

Monday, October 7th — 2.30 P. M. to 5 P. M.

Convention Called to Order.
Annual Address of the President.
Annual Report of the Executive Committee.
Annual Report of the Secretary-Treasurer.
Resolutions.
Appointment of Convention Committees.
Reports of Special Committees.
Report of Committee on Associate Membership.
Report of Committee on Subjects.
Report of Committee on City Rules.
Report of Committee on Interurban Rules.
Report of Committee on Uniform Definitions.

Tuesday, October 8th — 9.30 A. M. to 12.30 P. M.

Report of Committee on Block Signals for Electric Railways.
Report of Committee on Train Operation.
(Joint Session with Engineering Association in the Brown Room.)

Wednesday, October 9th — 9.30 A. M. to 12.30 P. M.

Appointment of Committee on Nominations.
Report of Committee on Passenger Traffic.
Report of Committee on Express and Freight Traffic.
Report of Committee on Express and Freight Accounting.
Report of Committee on Fares and Transfers.
Report of Committee on Statistical Unit for Car Operation.
(Joint Session with Accountants' Association.)

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Thursday, October 10th — 9.30 A. M. to 12.30 P. M.

Report of Committee on Training of Transportation Employees.
(Joint Session with Claim Agents' Association.)
Report of Committee on Construction of Schedules and Time-Tables.
PAPER — "One-man Prepayment Car Operation," by S. R. Inch, General Manager, Missoula Street Railway Co., Missoula, Mont.
General Business.
Report of Nominating Committee.
Election of Officers.
Installation of Officers.
Adjournment.

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REGISTRATION AT THE 1912 CONVENTION

* INDIVIDUAL MEMBER. *Note.*— Other Individual Members in attendance at the Convention of the Transportation and Traffic Association (not delegates of member companies) are given in a separate list which follows the list of Delegates of Member Companies.

(§ Indicates that the individual named is an officer and representative of more than one member company.)

PAST PRESIDENTS

*§Allen, C. Loomis, President, Newport News & Old Point Railway & Electric Co., Syracuse, N. Y.

§ Todd, R. I., President and General Manager, Indianapolis Traction & Terminal Co., Indianapolis, Ind.

*§Henry C. Page, General Manager, Worcester Consolidated Street Railway Co., Worcester, Mass.

DELEGATES OF MEMBER COMPANIES

ALABAMA CITY, GADSDEN & ATTALLA RAILWAY CO.:
Zell, Chas. J., Superintendent.

ALGIERS RAILWAY & LIGHTING CO.:
* Carr, C. E. A., General Manager.

ALTOONA & LOGAN VALLEY ELECTRIC RAILWAY CO.:
Crane, S. S., General Manager.

ARKANSAS VALLEY INTERURBAN RAILWAY CO.:
* Bell, Chas. D., Chief Engineer and General Superintendent.

ASHEVILLE POWER & LIGHT CO.:
Plummer, H. W., Vice-President and General Manager.

ATHENS RAILWAY & ELECTRIC CO.:
Proctor, C. L., General Superintendent.

ATLANTIC SHORE RAILWAY CO.:
Sturtevant, R. W., Trainmaster.

AURORA, ELGIN & CHICAGO RAILROAD CO.:
Breckenridge, Richard, Traffic Agent.
Bruce, B., Motorman.
Carlson, John, Roadmaster.
Collin, Harry A., Traffic Department.
DeWolf, W. R., Motorman.
Dolan, L. B., Motorman.
DuFlone, H., Motorman.
Eddy, R. A., Conductor.
Eickstardt, H., Motorman.
Faber, E. C., Vice-President and General Manager.

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Delegates of Member Companies — (Continued).

AURORA, ELGIN & CHICAGO RAILROAD CO.— (Concluded).
- Favreau, A. H., Division Superintendent.
- Gaylor, H., Motorman.
- Goodrich, C. B., Motorman.
- Gould, E. F., Assistant to General Manager.
- Gunderson, J. W., Division Superintendent.
- Guseman, J., Motorman.
- Herbert, W., Car Inspector.
- Jones, C. J., Superintendent Transportation.
- Krauts, L., Motorman.
- McKeen, C., Conductor.
- Maher, J. A., Motorman.
- Marsh, C., Conductor.
- Merwin, B. E., General Superintendent.
- Moorman, S. C., Division Superintendent.
- Rouse, Arthur K., Special Agent.
- Safford, J., Conductor.
- Schneider, Wm. H., Motorman.
- Sellers, D., Inspector.
- Shambo, C. M., Motorman.
- Sheridan, C. E., Dispatcher.
- Smardon, W. J., Statistician.
- Snyder, W. T., Conductor.
- Weed, J. L., Motorman.
- Williams, C. B., Conductor.
- Wilmont, M. G., Motorman.
- Wolsfeld, P. N., Conductor.

AUSTIN STREET RAILWAY CO.:
- * Jones, W. J., President and General Manager.

BANGOR RAILWAY & ELECTRIC CO.:
- Johnson, Chas. H., Superintendent Railway Department.

BENTON HARBOR–ST. JOE RAILWAY & LIGHT CO.:
- Cavanaugh, J. A., Superintendent.
- Mason, H. C., Manager.
- Pound, James H., General Freight and Passenger Agent.
- Welcher, W. E., Superintendent of Transportation.

BIRMINGHAM RAILWAY, LIGHT & POWER CO.:
- McClue, J. F., Inspector.
- Sloan, M. S., Assistant to President.

BOSTON ELEVATED RAILWAY CO.:
- * Brush, M. C., 2nd Vice-President.

BRITISH COLUMBIA ELECTRIC RAILWAY CO., LTD.:
- Goward, A. T., Local Manager.
- Prenter, S. L., Chief Clerk to General Manager.
- Purvis, Allan, Manager Interurban Lines.

BROOKLYN RAPID TRANSIT SYSTEM:
- Dempsey, J. J., Superintendent of Elevated Lines.

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Delegates of Member Companies — (Continued).

BUTTE ELECTRIC RAILWAY CO.:
Wathey, J. S., Superintendent.

CEDAR RAPIDS & IOWA CITY RAILWAY & LIGHT CO.:
* Dows, W. G., President and General Manager.
Munson, Chas., Assistant Superintendent and Master Mechanic.
Young, J. C., Superintendent.

CEDAR RAPIDS & MARION CITY RAILWAY CO.:
Diserens, F. L., Superintendent.

CHARLESTON CONSOLIDATED RAILWAY & LIGHTING CO.:
* Passailaique, T. W., Superintendent Railway Division.

CHATTANOOGA RAILWAY & LIGHT CO.:
Boileau, W. E., General Manager.

CHICAGO CITY RAILWAY CO.:
Benner, J. M., Supervisor.
Blakely, Thomas, Superintendent Supply Cars.
Boal, Samuel, Assistant Division Superintendent.
Bohlin, L. E., Clerk Transportation Department.
Bowles, D. F., Division Superintendent.
Cloney, John, Inspector.
Coe, John, Division Superintendent.
Excell, F. O., Traffic Clerk.
Fleming, H. B., Vice-President and General Manager.
Froom, E. A., Assistant Chief Clerk of Transportation.
Greene, P. A., Dispatcher.
Hayes, P. H., Special Agent.
Henning, J. F., Assistant Superintendent.
Irvine, F. C., Transportation Department.
Irvine, S. C., Superintendent of Division 4.
Kappen, Fred C., Motorman.
Kelley, H. C., Assistant Superintendent.
Lampe, E. P., Superintendent of Instruction.
McCauley, T. H., Manager and Electrical Engineer.
Manzer, C. R., Transportation and Traffic Department.
Morgan, E. H., Transportation and Traffic Department.
* Pratt, George W., Assistant Superintendent of Motive Power.
Quinn, M. D., Assistant Division Superintendent.
Walsh, Richard, Supervisor.
Watson, Wm., Division Superintendent.
Weatherwax, W. M., Superintendent of Transportation.
Weil, F. H., Employment Agent.

CHICAGO & INTERURBAN TRACTION CO.:
Kruger, W. R., Train Dispatcher.
Law, A. J., Roadmaster.
Purcell, John, Trainmaster.

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Delegates of Member Companies— (Continued).

CHICAGO & JOLIET ELECTRIC RAILWAY CO.:
* Blackhall, J. R., General Manager.
Heun, W. H., Superintendent of Transportation.
Jack, J. B., Assistant Superintendent of Transportation.
Jordan, A. W., Traffic Agent.
Oquist, F. D., Supervisor.

CHICAGO, LAKE SHORE & SOUTH BEND RAILWAY CO.:
Dreibelbis, P. F., Conductor.
Egwolf, J. F., Dispatcher.
Forsyth, J. A., Roadmaster.
Gray, J. K., Superintendent.
Havrstick, J. N., Assistant to Superintendent.
Helm, George, Motorman.
Moore, John S., Terminal Passenger Agent.
Woodward, W. O., Traffic Manager.

CHICAGO & MILWAUKEE ELECTRIC RAILROAD CO.:
* Bock, E. J., General Superintendent.
Doane, J. A., Superintendent of Transportation.
Law, F. E., Division Superintendent.

CHICAGO RAILWAYS CO.:
Anderson, T., Inspector.
Aitken, W. B., Station Superintendent.
Bain, J., Inspector.
Bell, Wm., Inspector.
Blanchard, George, Assistant to General Manager.
Borne, J. E., Inspector.
Brookman, E. L., Transportation Department.
Burns, J. W., Inspector.
Caul, Charles, General Roadmaster.
Chadwick, H. R., Inspector.
Chambers, C., Assistant Roadmaster.
Cook, Wm., Assistant Station Agent.
Duffy, P. J., Station Superintendent.
* Ecker, E. C., Assistant to General Manager.
Edinger, Frank, Station Superintendent.
Emms, G., Assistant Station Superintendent.
Fish, W., Vice-President and General Manager.
Goggin, Thos., Inspector.
Goodison, W. H., Inspector.
Grunwald, Otto, Assistant Station Superintendent.
Halkett, W. S., Superintendent of Employment.
Hall, W. A., Inspector.
Halm, Wm. E., Schedule Department.
Hamilton, Charles, Station Superintendent.
Harrington, Michael, Station Superintendent.
Hays, R. L., Station Superintendent.
Hedgins, Thomas, Transportation Department.

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Delegates of Member Companies — (Continued).
CHICAGO RAILWAYS CO.— (Concluded).
Hollmeyer, J. P., Inspector.
Horn, Henry, Operator.
Huff, H., Assistant Station Superintendent.
Jerney, D. F., Assistant Station Superintendent.
Johnson, J. M., Station Superintendent.
Johnston, E., Assistant Roadmaster.
Johnston, J. W., Inspector.
Kriet, Joseph, Assistant Station Superintendent.
Kroll, W. M., Superintendent Station.
Larkin, J. H., Superintendent of Inspectors.
Larson, Walter, Clerk Transportation Department.
McGann, W. F., Inspector.
McGuire, E. L., Station Superintendent.
Madsen, Ed., Inspector.
Meyer, E. M., Transportation Department.
Meyer, Wm., Superintendent.
Mollohan, P. D., Inspector.
Murray, James J., Station Superintendent.
Nordin, Henry W., Transportation Department.
Pearce, W. C., Superintendent of Time-Tables.
Phillips, B., Chief Inspector.
Phillips, Benjamin, Assistant Superintendent of Transportation.
Robinson, D. A., Inspector.
Roberts, S. B., Assistant Station Superintendent.
Rochford, J. S., Assistant Station Superintendent.
Rogers, G. L., Operator.
Semple, A. E., Inspector.
* Sullivan, J. V., General Supervisor.
Voight, George, Chief Inspector.
Walker, F. H., Service Inspector.
Wells, W. C., Assistant Station Superintendent.
Zinn, C., Inspector of Station Records.
CHICAGO, SOUTH BEND & NORTHERN INDIANA RAILWAY CO.:
Dailey, E. P., Manager of Parks.
*Emmons, C. D., General Manager.
* Hardy, F. I., Superintendent of Transportation.
Hollar, L. E., Chief Dispatcher.
Pearsons, J., General Passenger and Freight Agent.
Schall, Henry, Superintendent.
Smith, C. H., Chief Clerk to General Manager.
CHIPPEWA VALLEY RAILWAY, LIGHT & POWER CO.:
Lawrence, H. G., Superintendent.
Pierce, A. E., Assistant Manager.
* Wheeler, George B., Secretary and General Manager.
CINCINNATI TRACTION COMPANY:
Stevens, Dana, Vice-President and General Manager.

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Delegates of Member Companies — (Continued).

CITIZENS TRACTION CO. (THE):
* Shaffer, F. D., General Manager.

CLEVELAND, PAINESVILLE & EASTERN RAILROAD CO.:
Espy, J. C., Superintendent of Transportation.
Jordan, J., Vice-President and General Manager.
Rider, L. J., Roadmaster.

CLEVELAND RAILWAY CO. (THE):
Cook, W. T., Transportation Department.
Deitrick, A. L., Transportation Department.
* Radcliffe, George L., General Manager.

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY CO.:
Schneider, E. F., General Manager.

CLINTON STREET RAILWAY CO.:
Bohnson, B., Superintendent.

COLORADO SPRINGS & INTERURBAN RAILWAY CO.:
Lathrop, B. M., Superintendent.

COLUMBIA RAILWAY, GAS & ELECTRIC CO.:
Dustin, G. K., General Manager.

CONESTOGA TRACTION CO.:
Titzel, C. Edgar, General Manager.

COUNTY TRACTION CO.:
Chambers, F. C., General Superintendent.
Dowse, W. S., Motorman.
Gilbert, L. A., Transportation Superintendent.
Melton, Charles, Traction Department.
Weidenfeller, George, Superintendent.

DALLAS CONSOLIDATED ELECTRIC STREET RAILWAY CO.:
Moore, E. T., Local Manager.

DAYTON, COVINGTON & PIQUA TRACTION CO.:
Brennan, T. J., General Superintendent.

DAYTON, SPRINGFIELD & XENIA SOUTHERN RAILWAY CO.:
Ferneding, T. A., Vice-President and General Manager.
Gebhart, Henry, Assistant General Manager.
Howell, T. E., Operating Department.

DENVER CITY TRAMWAY CO. (THE):
* Beeler, John A., Vice-President and General Manager.
* Wells, C. B., Superintendent of Transportation.

DETROIT UNITED RAILWAY:
* Brooks, Frank W., General Manager.
Dohrman, Paul W., Assistant General Superintendent.
* Parker, George W., General Express and Freight Agent.
Van Zandt, A. D. B., Publicity Agent.

EAST ST. LOUIS & SUBURBAN RAILWAY CO.:
* Macy, O. C., Superintendent.
* Purinton, A. J., General Superintendent.

EASTERN PENNSYLVANIA RAILWAYS CO.:
* Rockwell, W. B., Manager.

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Delegates of Member Companies— (Continued).

EASTERN WISCONSIN RAILWAY & LIGHT CO.:
Kelsh, W. J., Superintendent.
Pulliam, J. P., General Manager.

EASTON TRANSIT CO.:
Fehr, H. R., President and General Manager.

ELGIN & BELVIDERE ELECTRIC COMPANY:
Downs, E. E., General Manager.
Vivian, E. H., Traffic Manager.

ELMIRA, CORNING & WAVERLY RAILWAY CO.:
Hammond, C. B., Assistant Superintendent.

ENID CITY RAILWAY CO.:
* Kline, C., General Superintendent.

EVANSVILLE RAILWAYS CO.:
Carson, W. A., General Manager.
Millican, G. R., Superintendent.

EVERETT RAILWAY, LIGHT & WATER CO.:
Carrick, K. K., General Traffic Agent.

EXETER, HAMPTON & AMESBURY STREET RAILWAY CO.:
MacAdams, J. A., Manager.

GALESBURG & KEWANEE ELECTRIC RAILWAY CO.:
Hayward, R. H., General Manager.

FONDA, JOHNSTOWN & GLOVERSVILLE R. R. CO.:
* Collins, W. H., General Manager.

FORT SMITH LIGHT & TRACTION CO.:
McCarthy, P. O., Superintendent of Transportation.

FORT WAYNE & NORTHERN INDIANA TRACTION CO.:
Abbott, J., Superintendent.
Greenland, J. A., General Passenger and Freight Agent.
Greenland, S. W., Assistant General Manager.
* Palmer, C. E., Superintendent of Transportation.
Warwick, C. E., Local Superintendent.

FORT WAYNE & SPRINGFIELD RAILWAY CO.:
* Fledderjohann, W. H., General Manager.

FREDERICK RAILROAD CO.:
Smith, R. Paul, Superintendent.

GALVESTON-HOUSTON ELECTRIC RAILWAY CO.:
Berry, V. W., Superintendent.
Bradley, L. C., Manager.

GENEVA & AUBURN RAILWAY CO.:
*Atwood, W. B. Vice-President and General Manager.

GEORGIA RAILWAY & POWER CO.:
Matthews, O. H., Assistant Superintendent of Transportation.
Saul, M., Publicity Manager.

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Delegates of Member Companies — (Continued).

GRAND RAPIDS, GRAND HAVEN & MUSKEGON RAILWAY CO.:
McNaughton, L. R., Trainmaster.
Morley, W. K., Vice-President and General Manager.
Rickerd, Byron, Roadmaster.
Vaughan, S. L., Traffic Manager.

GRAND RAPIDS RAILWAY CO.:
Hanchett, Benj. S., President and General Manager.
Madigan, John C., Superintendent.

GRAYS HARBOR RAILWAY & LIGHT CO.:
Bradner, E. A., Superintendent.

HARTFORD & SPRINGFIELD STREET RAILWAY CO.:
Reynolds, R. W., General Manager.

HELENA LIGHT & RAILWAY CO.:
Sharp, W. C., General Superintendent.

HOLYOKE STREET RAILWAY CO.:
Pellissier, Louis D., General Manager.

HORNELL TRACTION CO. (THE):
Proctor, D. A., General Manager.

HOUGHTON COUNTY TRACTION CO.:
Ralph, John, Jr., Superintendent.

HUDSON & MANHATTAN RAILROAD CO.:
Klumpp, C. S., Assistant to General Superintendent.
* Munger, E. T., General Superintendent.

HUNTINGTON RAILROAD CO.:
Kineon, James P., Superintendent.

ILLINOIS TRACTION SYSTEM:
Doane, J. P., General Superintendent, Jacksonville Lines.
Morgan, T. A., Trainmaster.

CHICAGO, OTTAWA & PEORIA RAILWAY CO.:
Blackburn, A. E., Traffic Manager.
Fisher, F. E., General Superintendent.

DECATUR RAILWAY & LIGHT CO.:
Harry, M. L., General Superintendent.

GALESBURG RAILWAY & LIGHT CO.:
Nelson, Edward H., Superintendent of Railway.

PEORIA RAILWAY CO.:
Bailey, R. W., General Superintendent.

URBAN & CHAMPAIGN RAILWAY, GAS & ELECTRIC CO.:
Pepper, H. J., General Superintendent.

INDIANAPOLIS & CINCINNATI TRACTION CO.:
Cox, LeRoy, Supervisor.
Henry, C. L., President.
Lively, Oscar, Superintendent.

INDIANAPOLIS, COLUMBUS & SOUTHERN TRACTION CO.:
Goshorn, A. W., Assistant Trainmaster.

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Delegates of Member Companies — (Continued).

INDIANAPOLIS, CRAWFORDSVILLE & DANVILLE ELECTRIC RAILWAY CO.:
Spellman, J. N., General Manager.

INDIANAPOLIS TRACTION & TERMINAL CO.:
Elward, J. F., Chief Inspector.
Todd, R. I., President and General Manager.
Tretton, James P., Assistant Superintendent.

INTERBOROUGH RAPID TRANSIT CO.:
* Hedley, Frank, Vice-President and General Manager.

NEW YORK & QUEENS COUNTY RAILWAY CO.:
Wood, W. O., President and General Manager.

NEW YORK RAILWAYS CO.:
* Palmer, L. H., Superintendent of Transportation.
* Wood, F. T., Assistant to General Manager.

INTERURBAN RAILWAY & TERMINAL CO.:
Talbot, F. H., General Superintendent.

IOWA CITY ELECTRIC RAILWAY CO.:
Schulze, J. O., President and General Manager.

IOWA & ILLINOIS RAILWAY CO.:
* Crafts, P. P., General Manager.
Crafts, W. P., Assistant General Manager.
Cummins, George M., Freight Traffic Manager.

ITHACA STREET RAILWAY CO.:
Clancy, T. P., General Superintendent.

JACKSONVILLE TRACTION CO.:
Croom, Hardy, Manager.

KANSAS CITY, CLAY COUNTY & ST. JOSEPH RAILWAY CO.:
Harrigan, J. R., General Manager.

KANSAS CITY RAILWAY & LIGHT CO.:
Fennell, D. L., Division Superintendent.
Gibson, J. E., General Superintendent.
Harvey, J. H., Superintendent of Employment.

KANSAS CITY-WESTERN RAILWAY CO.:
Richardson, J. W., General Superintendent.

KENTUCKY TRACTION & TERMINAL CO.:
Bush, Henry, Superintendent of Transportation.
Oppenheimer, I. L., General Manager.
Sallee, J. D., Freight Traffic Manager.

KEY WEST ELECTRIC CO.:
* Grooms, B. L., Superintendent of Railway.

KINGSTON CONSOLIDATED RAILROAD CO.:
§*H. C. Page, First Vice-President.

KINGSTON, PORTSMOUTH & CATARAQUI ELECTRIC RAILWAY CO.:
Nickle, Hugh C., General Superintendent.

KNOXVILLE RAILWAY & LIGHT CO.:
* Harvey, C. H., President and General Manager.
* Kelly, T. C., Superintendent Railway Department.

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Delegates of Member Companies— (Continued).

LAKE SHORE ELECTRIC RAILWAY CO.:
Burge, L. K., General Superintendent.
Coen, F. W., Vice-President and General Manager.
Roth, F. J., Park Manager.
* Starkey, J. F., Passenger Agent.

LAWRENCE RAILWAY & LIGHT CO.:
Skinner, J. T., Manager.

LEHIGH VALLEY TRANSIT CO.:
Stevens, R. P., President and General Manager.

LITTLE ROCK RAILWAY & ELECTRIC CO.:
*Griffith, C. J., Treasurer and General Manager.

LOS ANGELES RAILWAY CORPORATION:
* Henderson, C. A., Assistant General Manager.

LOUISVILLE RAILWAY CO.:
Riddle, Samuel, Superintendent.

MACON RAILWAY & LIGHT CO.:
Williamson, T. H., Superintendent of Transportation.

MAHONING & SHENANGO RAILWAY & LIGHT CO.:
Beckman, C. C., Assistant Superintendent.
* Crawford, J. B., Assistant to General Manager.

MARQUETTE COUNTY GAS & ELECTRIC CO.:
McCorkindale, W. J., General Manager.

MARYLAND ELECTRIC RAILWAYS CO.:
* Cherry, T. C., General Manager.

MASON CITY & CLEAR LAKE RAILROAD CO.:
Hanlon, F. J., Secretary and General Manager.

MEMPHIS STREET RAILWAY CO.:
* Ford, E. W., General Superintendent.

MENOMINEE & MARINETTE LIGHT & TRACTION CO.:
Daniell, Edward, General Manager.
Rocque, Joseph, General Foreman Street Railway Department.

MERIDIAN LIGHT & RAILWAY CO.:
* McArthur, I. H., Superintendent.

METROPOLITAN WEST SIDE ELEVATED RAILWAY CO.:
Borter, F. L., Schedule Clerk.
Doege, H. L., Secretary to General Manager.
Ellingson, E., Assistant Station Inspector.
Elston, O. C., Dispatcher.
* Feron, M. J., General Superintendent of Transportation.
Fischer, J. A., Road Dispatcher.
Griffin, R. N., Superintendent.
Jarvis, J. A., Superintendent.
Kelley, Wm. C., Trainmaster.
Koepke, W., Secretary to Superintendent.
Marshall, F. A., Service Inspector.
Noe, E. C., General Manager.

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Delegates of Member Companies— (Continued).

METROPOLITAN WEST SIDE ELEVATED RAILWAY CO.— (Concluded).

Page, Robert, Station Inspector.
Parkinson, Robert, Assistant Trainmaster.
Patten, C. E., General Agent.
Powers, John M., Motorman.
Reesch, Ernest F., Station Inspector.
Schwartz, Louis, Motorman.
Seely, G. T., Assistant General Manager.

CHICAGO & OAK PARK ELEVATED RAILROAD CO.:

Baxter, Charles A., Trainmaster.
Hardin, H. G., Superintendent of Transportation.
McDonald, J. A., Roadmaster.

NORTHWESTERN ELEVATED RAILWAY CO.:

Chamberlain, L. M., Station Inspector.
Cochran, D. C., Dispatcher.
Flenner, A. B., Trainmaster.
Glassen, F. E., Assistant Trainmaster.
Hopkins, J. J., Inspector.
Jeffries, P. H., Chief Train Dispatcher.
Mamer, E. L., Dispatcher.
Milne, T. D., Trainmaster.
Nickerson, B. F., Roadmaster.
Popp, Wm., Dispatcher.
Schaaf, E. F., Superintendent of Transportation.
Swanson, E. R., Dispatcher.
Willis, A. E., Dispatcher.

SOUTH SIDE ELEVATED RAILWAYS:

Aklon, George R. H., Dispatcher and Time Checker.
Ambrose, R. J., Station Inspector.
Burns, F. P., Inspector.
Clarke, James A., Dispatcher.
Crawford, George F., Time Checker.
Croon, H. B., Inspector.
Davis, John E., Night Train Master.
Farrell, J. M., Inspector, Transportation Department.
Feldhke, John M., Superintendent.
Fisher, C. A., Train Dispatcher.
Flegel, W. C., Train Dispatcher.
Ford, J. M., Service Inspector.
Geary, Anthony, Dispatcher.
Gerard, Chas., Dispatcher.
Gillon, Edward H., Service Inspector.
Hargrove, Robert, Dispatcher and Time Checker.
Higgins, Charles, Chief Station Inspector.
Holst, Arthur H., Guard.
Jones, R. E., Dispatcher.

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Delegates of Member Companies — (Continued).

SOUTH SIDE ELEVATED RAILWAYS — (Concluded.)

Kent, R. B., Dispatcher.
Lanier, V. C., Switchman.
McTee, John, Inspector.
Mallon, C. F., Passenger Director.
Mallon, J. H., Train Master.
Matthews, C. N., Dispatcher.
Miller, E. F., Motorman.
Park, E. W., Train Dispatcher.
Ritzer, M. S., Dispatcher.
Spencer, L., Train Dispatcher.
Tischer, E., Transportation Department.
Wells, George W., Ticket Agent.
Williams, J. C., Train Dispatcher.
Wolfenberger, C., Transportation Department.

MICHIGAN UNITED TRACTION CO.:

* Morgan, C. E., General Superintendent.

MILFORD & UXBRIDGE STREET RAILWAY CO.:

Adams, W. L., General Manager.

MILWAUKEE ELECTRIC RAILWAY & LIGHT CO.:

* Bell, Peter B., Division Superintendent.
* Killa, A. J., Superintendent.
* Kuemmerlein, George, Jr., Superintendent of Transportation.
* Lederer, Charles F. C., Roadmaster.
Luchterland, N., Station Clerk.
* Mohm, John P., Supervisor.
* Scheife, H. F., Division Superintendent.
Seeber, E., Transportation Department.
* Stearns, R. B., Vice-President and General Manager.
* Urban, H. L., Division Superintendent.
Wallaer, A. E., Division Superintendent.
* White, J. E., Division Superintendent.
Yeo, Fred. W., Superintendent of Schedules.

MILWAUKEE-WESTERN ELECTRIC RAILWAY CO.:

Barber, J. W., Secretary and Assistant General Manager.

MINNEAPOLIS, ST. PAUL, ROCHESTER & DUBUQUE ELECTRIC TRACTION CO.:

Martin, F. A., Superintendent and Purchasing Agent.

MISABA RAILWAY CO.:

Newton, H. S., General Manager.

MISSOULA STREET RAILWAY CO.:

Inch, S. R., General Manager.

MOBILE LIGHT & RAILROAD CO.:

Wilson, J. H., President and Manager.

MONONGAHELA VALLEY TRACTION CO.:

Hood, Smith, General Superintendent.
Watson, J. O., General Manager.

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Delegates of Member Companies — (Continued).

MONTGOMERY TRACTION CO.:
* Mathes, L. D., General Manager.

MONTREAL TRAMWAYS CO.:
* Gaboury, A., Superintendent.

MOOSE JAW ELECTRIC RAILWAY CO.:
Dion, A. H., Superintendent.

MUNCIE & PORTLAND TRACTION CO.:
Lincoln, E. B., General Manager.

MUSKEGON TRACTION & LIGHTING CO.:
Young, John T., President and General Manager.

MUSKOGEE ELECTRIC TRACTION CO.:
* Long, R. D., Manager.

NAHANT & LYON STREET RAILWAY CO.:
Dozier, J. E., General Manager.

NEW ORLEANS RAILWAY & LIGHT CO.:
* Dressel, H. J., Superintendent.
* Hegarty, D. A., Manager.
O'Brien, R. M., Assistant Superintendent.

NEWPORT NEWS & OLD POINT RAILWAY & ELECTRIC CO.:
*Allen, C. Loomis, President.
* Peck, E. F., Vice-President.
* Shannahan, J. N., Vice-President and General Manager.

NEW YORK & NORTH SHORE TRACTION CO.:
Emerson, R. W., General Superintendent.

NEW YORK STATE RAILWAYS CO.:
Callaghan, W. C., Superintendent of Transportation (City Lines).
* Cook, E. J., Vice-President.
Hicks, Herman E., Supervisor of Schedules.
Kilbride, M. D., Superintendent of Transportation (Interurban Lines).
Wilson, B. E., General Passenger and Express Agent.

NORFOLK & BRISTOL STREET RAILWAY CO.:
Cavanaugh, M. A., General Manager.
Perry, F. Monroe, Superintendent.

NORTHAMPTON STREET RAILWAY CO.:
Pellissier, L. D., General Manager.

NORTHERN ILLINOIS LIGHT & TRACTION CO.:
Hess, Louis W., General Superintendent.

NORTHERN OHIO TRACTION & LIGHT CO.:
Currie, Charles, General Manager.
Douglas, W. H., Superintendent.
Scanlon, D. A., Division Superintendent.

NORTHERN TEXAS TRACTION CO.:
Clifford, George H., Vice-President and Manager.

NORTHAMPTON STREET RAILWAY CO.:
* Hay, W. O., Vice-President and General Manager.

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Delegates of Member Companies— (Continued).

NORTHWESTERN PENNSYLVANIA RAILWAY CO.:
Murray, C. L., General Manager.
* Shryock, E. O., Superintendent.

OHIO ELECTRIC RAILWAY CO.:
Cochran, J. E., Superintendent of Lines and Stations.

OHIO VALLEY ELECTRIC RAILWAY CO.:
Gunther, W. B., Superintendent of Transportation.
Magoon, W. W., General Manager.

OKLAHOMA RAILWAY CO.:
* Johnson, J. J., Assistant General Manager.
* Knox, George W., 2nd Vice-President and General Manager.

OMAHA, LINCOLN & BEATRICE RAILWAY CO.:
Norton, H. S., Secretary, Treasurer and Manager.

OTSEGO & HERKIMER RAILROAD CO.:
* Choate, Joseph K., General Manager.

OTTAWA ELECTRIC RAILWAY CO.:
* Burpee, F. D., Superintendent.

OTTUMWA RAILWAY & LIGHT CO.:
Fahrney, C. E., General Manager.

PACIFIC ELECTRIC RAILWAY CO.:
* McMillan, J., General Manager.

PANAMA TRAMWAYS CO.:
* Young, C. G., Consulting Engineer.

PENNSYLVANIA RAILROAD CO.:
* Chase, E. P., Inspector, Department of Foremen of Motormen.
Thorp, T. H., Passenger Agent.

PEOPLES RAILWAY CO. (DAYTON, OHIO):
Towle, George C., General Manager.

PHILADELPHIA RAPID TRANSIT CO.:
Davies, J. R., Superintendent of Willow Grove Park.

PITTSBURG & BUTLER STREET RAILWAY CO.:
Carpenter, E. C., General Manager.

PITTSBURGH RAILWAYS CO.:
Jones, P. N., General Superintendent.
Kelly, P. R., Supervisor.
McCune, J. C., Traffic Department.
Williams, Oscar, Supervisor.

PORTLAND RAILWAY LIGHT & POWER CO.:
Franklin, C. J., General Superintendent.
* Hild, F. W., General Manager.

POTTSVILLE UNION TRACTION CO.:
§ * Rockwell, W. B., Manager.

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Delegates of Member Companies — (Continued).

PUBLIC SERVICE RAILWAY CO.:
* Brown, J. W., Assistant Superintendent of Transportation.
* Graham, W. B., Division Superintendent.
* Jackson, A., Superintendent of Time-Tables.
* O'Toole, J. L., Publicity Agent.
* Titus, W. E., Superintendent.

QUINCY RAILWAY CO.:
McAfee, D., Assistant to Manager.
Martin, W. A., Local Manager.
Williams, J. C., Superintendent.

ROANOKE RAILWAY & ELECTRIC CO.:
Bush, W. T., Superintendent of Railway.

ROCKFORD & INTERURBAN RAILWAY CO.:
Shockley, C. C., General Freight and Passenger Agent.
Sparks, W. C., General Manager.

ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER CO.:
* Bocock, O. L., Superintendent of Transportation.
Van Brunt, J. H., Vice-President and General Manager.

SAN ANTONIO TRACTION CO.:
Brown, T. C., Superintendent of Transportation.
Rambe, A. V., Inspector.

SAN DIEGO ELECTRIC RAILWAY CO.:
Warner, B. M., General Superintendent.

SCHENECTADY RAILWAY CO.:
§ * Hamilton, James F., General Manager.

SCRANTON RAILWAY CO.:
Caum, Frank, General Manager.

SHEBOYGAN RAILWAY & ELECTRIC CO.:
Craigmile, Charles, Dispatcher.
Hammett, Edward, Superintendent.
Pettey, F., Dispatcher.

SHEFFIELD CO. (THE):
Johnson, H. B., General Manager.

SHORE LINE ELECTRIC RAILWAY CO.:
Welton, Clark H., Superintendent.

SIOUX FALLS TRACTION SYSTEM:
Mills, F. M., President and General Manager.

SOUTHEASTERN OHIO RAILWAY, LIGHT & POWER CO.:
Neikirk, W. H., Secretary, Treasurer and Manager.

SOUTHERN WISCONSIN RAILWAY CO.:
Holcomb, George, Superintendent of Transportation.

SOUTHWEST MISSOURI RAILROAD CO.:
Harbaugh, T. A., Superintendent of Transportation.
* Pratt, E. J., General Superintendent.

SPRINGFIELD RAILWAY CO.:
Gunn, E. B., Superintendent of Traffic.

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Delegates of Member Companies — (Continued).

SPRINGFIELD TRACTION CO.:
Guckel, Charles H., General Manager.

STERLING, DIXON & EASTERN ELECTRIC RAILWAY CO.:
* Treat, Dean, District Superintendent.

SYRACUSE RAPID TRANSIT RAILWAY CO.:
* Duffy, J. E., General Superintendent.
§* Gowen, C. R., General Passenger Agent.
§* Tilton, B. E., General Manager.
§* Watts, F. W., General Express Agent.

SYRACUSE & SUBURBAN RAILROAD CO.:
§ * Allen, C. L., President.
* Badgero, Milford, General Manager.

TACOMA RAILWAY & POWER CO.:
* Rounds, G. W., General Superintendent.

TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION CO.:
Barker, R. C., Dispatcher.
Crall, J. H., General Passenger and Freight Agent.
Gordan, H. G., Superintendent.
Gordon, A. A., Superintendent.
* Grover, T. F., General Manager (Terre Haute Division).
Jeffries, G. K., General Superintendent.
Moorehouse, Chas., Inspector.
Nash, M. M., Superintendent of Railway (Terre Haute Division).
Richardson, C. F., Superintendent.
Spilman, O. P., Superintendent.
§ Todd, R. I., President and General Manager.

TEXARKANA GAS & ELECTIC CO.:
Wood, W. L., Jr., Manager.

TOLEDO & CHICAGO INTERURBAN RAILWAY CO. (THE):
Munton, C. J., General Superintendent.
Patterson, G. M., Traffic Manager

TOLEDO RAILWAYS & LIGHT CO.:
Christenson, L. A., Special Agent
Enright, J. M., Manager of Railways.
* Kelsey, E. R., Publicity Department.

TORONTO RAILWAY CO.:
Break, J., Superintendent.
Livingston, T. T., Traffic Manager.
Pursley, H., Divisional Superintendent.
Steele, C. W., Divisional Superintendent.

TRI-CITY RAILWAY CO.:
Brundage, F. C., Assistant Superintendent.
Huntoon, J. G., General Superintendent.

TRI-STATE RAILWAY & ELECTRIC CO.:
* Griffin, W. R. W., General Manager.

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Delegates of Member Companies— (Continued).

TWIN CITY RAPID TRANSIT CO.:
Karow, Edward, Assistant General Manager

UNION ELECTRIC CO.:
Smith, A. H., Railway Superintendent.
* Walker, E. M., General Manager

UNION STREET RAILWAY CO.:
* Wilde, Elton S., General Superintendent.

UNION TRACTION COMPANY OF INDIANA:
* Baldwin, C. A., Superintendent of Transportation.
* Nicholl, H. A., General Manager.
* Norviel, F. D., General Passenger and Freight Agent.

UNITED RAILWAYS COMPANY OF ST. LOUIS:
* Cameron, Bruce, Superintendent of Transportation.
McCulloch, Richard, Vice-President and Assistant General Manager.

UNITED TRACTION CO.:
§ * Hamilton, James F., General Manager.

UTAH LIGHT & RAILWAY CO.:
Wells, Joseph S., General Manager.

UTICA & MOHAWK VALLEY RAILWAY CO.:
§ * Gowen, Chas. R., General Passenger Agent.
§ * Tilton, B. E., General Manager.
§ * Watts, F. W., General Express Agent.

WASHINGTON-VIRGINIA RAILWAY CO.:
Rich, J. W., Superintendent.

WATERLOO, CEDAR FALLS & NORTHERN RAILWAY CO.:
Cass, C. D., General Manager
Cheney, C. M., General Freight and Passenger Agent.
Lamb, O. S., Superintendent.

WAUPACA ELECTRIC LIGHT & RAILWAY CO.:
Lord, Irving P., President and General Manager.

WESTERN NEW YORK & PENNSYLVANIA TRACTION CO.:
Miller, I. W., General Superintendent.

WEST PENN RAILWAYS CO.:
Coffey, M. A., Superintendent of Transportation.

WHEELING TRACTION CO.:
Burke, Thomas, Division Superintendent.
Marple, J. D., Division Superintendent.
* Marsh, Charles M., Superintendent of Transportation.
* Nagle, G. O., General Manager.
Wright, Edward, Division Superintendent.

WILKES-BARRE & HAZELTON RAILROAD CO.:
Harger, A. F., Superintendent of Transportation.

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Delegates of Member Companies — (Concluded).

WILKES-BARRE RAILWAYS CO.:
Ervin, E. G., Superintendent of Transportation.
Kinffen, Lewis P., Inspector.
Mullery, Charles E., Inspector.

WILMINGTON & PHILADELPHIA TRACTION CO.:
Heindle, Wm. A., Manager.

WINDSOR, ESSEX & LAKE SHORE RAPID RAILWAY CO.:
Cooper, C. P., Chief Dispatcher.
* Eastman, A., General Manager.
Hughes, E. S., Traffic Manager.
Westman, A. W., General Superintendent.

WINNIPEG ELECTRIC RAILWAY CO.:
Knox, R. R., Superintendent of Transportation.

WINONA RAILWAY & LIGHT CO.:
Howard, R. M., General Manager.

WISCONSIN PUBLIC SERVICE CO.:
Bushong, A. T., Superintendent.

WISCONSIN TRACTION, LIGHT, HEAT & POWER CO.:
Beggs, John I., President & General Manager.
Ellis, A. E., Secretary, Treasurer & General Superintendent.

WORCESTER CONSOLIDATED STREET RAILWAY CO.:
§ * Page, Henry C., General Manager.

YAKIMA VALLEY TRANSPORTATION CO.:
Robbins, C. H., Assistant Superintendent.

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MEMBERS (INDIVIDUAL) IN ATTENDANCE

EDITOR'S NOTE.— The names of other individual members in attendance at the Convention are given in the list of Delegates of Member Companies and are there designated by means of an asterisk (*).

Anderson, James, Manager, Sandwich, Windsor & Amherstburg Railway Co., Windsor, Ontario, Canada.

Badger, J. S., Manager, Brisbane Tramway Co., Brisbane, Queensland, Australia.

Bean, W. Worth, Benton Harbor, Mich.

Blakeslee, R. B., Superintendent, DuBois Traction Co., DuBois, Pa.

Boyce, W. H., Superintendent, Beaver Valley Traction Co., New Brighton, Pa.

Buchanan, F. T., Superintendent, The Blue Hill Street Railway Co., Canton, Mass.

Coleman, E. P., General Manager, Dominion Power & Transmission Co., Hamilton, Ontario, Canada.

Crossman, T. E., 971 73rd Street, Brooklyn, N. Y.

Foltz, S. A., General Manager, Mansfield Railway, Light & Power Co., Mansfield, O.

Frick, H. C., President and General Manager, National Railway Training Association, Dwight Building, Kansas City, Mo.

Gorenflo, W. F., General Manager, Gulfort & Mississippi Traction Co., Gulfport, Miss.

Griffith, F. B., Superintendent of Interurban Lines, Dominion Power & Transmission Co., Hamilton, Ontario, Canada.

Hardgrave, A., Manager and Chief Engineer, Shawnee Electric Railways Co., Shawnee, Okla.

Hill, M. J., General Manager, Trenton–Bristol & Philadelphia Street Railway Co., Bristol, Penn.

Hyman, Edgar H., General Manager, Electric Package Agency, Cleveland, O.

Ingham, W. B., Inspector of Traffic, Public Utilities Commission, 738 Broad Street, Newark, N. J.

Jackson, D. C. & W. B., Construction Engineers, Harris Trust Building, Chicago, Ill.

Justeson, J. C., Superintendent of Railway, Wausau Street Railroad Co., Wausau, Wis.

King, C. B., Manager, London Street Railway Co., London, Ontario, Canada.

Mooney, John T., Superintendent Buffalo & Depew Railway Co., Depew, N. Y.

Muhlhausen, Gus, General Manager, Evansville, Suburban & Newburgh Railway Co., Evansville, Ind.

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Members (*Individual*)—Concluded.

Mullaney, T. F., Third Avenue Railroad Co., 130th Street and Third Avenue, New York, N. Y.

Murphy, J. T., Superintendent, Chicago Heights Street Railway Co., Chicago, Ill.

Ogle, Thomas B., Superintendent, Norfolk & Southern Railway Co., Norfolk, Va.

Spangler, Geo. M., Jr., Manager, Chicago Association of Commerce, 20 West Jackson Boulevard, Chicago, Ill.

Van Valkenburgh, E. C., 2015 West 102nd Street, Chicago, Ill.

Wisch, P. Edward, President, P. Edward Wisch Service Co., 171 Broadway, New York, N. Y.

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GUESTS IN ATTENDANCE

(Representatives of Electric and Steam Railway Companies.)

BERLIN & WATERLOO STREET RAILWAY:
McIntyre, V. S., Superintendent.

BURLINGTON TRACTION CO.:
Hendee, H. D., Assistant Superintendent.

CAIRO RAILWAY & LIGHT CO.:
Crassley, W. F., General Superintendent.

CALUMET & SOUTH CHICAGO RAILWAY CO.:
Antwerp, D. F., Assistant Superintendent.
Burgee, J., General Manager.
Talmadge, O. G., Superintendent.
Wagner, L. C., Secretary to General Manager.

CHICAGO & ALTON RAILWAY CO.:
Bailey, Wm. H., Traveling Freight Agent.

CHICAGO & GREAT WESTERN RAILWAY:
Yaunt, D. G., Operator.

CLEVELAND & ERIE RAILWAY CO.:
Palmer, R. W., Manager.

COLORADO SPRINGS & CRIPPLE CREEK DISTRICT RY. CO.:
Flaherty, J. B., Superintendent.

DEKALB-SYCAMORE & INTERURBAN TRACTION CO.:
Hays, W. S., Business Manager.

ELGIN, JOLIET & EASTERN RAILWAY:
Morrison, J. J., Train Master.

GARY & INTERURBAN RAILWAY CO.:
Burton, C. P., Publicity Department.
Miller, A., Traffic Manager.
Phillips, W. C., General Superintendent.

GRAND TRUNK RAILWAY:
Strauss, S. I., Chief Tariff Bureau.

GRAND VIEW RAILROAD CO.:
Massengale, Lee, General Manager.

HAMMOND RAILWAY & LIGHTING CO.:
Ray, William, Manager.

HAMMOND, WHITING & EAST CHICAGO RAILWAY CO.:
Green, H. S., Manager.

ILLINOIS CENTRAL ELECTRIC RAILWAY CO.:
Plattenburg, F. W., Manager.

JOLIET & SOUTHERN TRACTION CO.:
Eckman, F. C., General Manager.

KANKAKEE ELECTRIC RAILWAY CO.:
Rollins, B. M., Manager.

LACROSSE CITY RAILWAY CO.:
Natier, P., Superintendent.

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Guests in Attendance — (Concluded).

LINCOLN TRACTION CO.:
Bramlette, J. N., Superintendent.

MICHIGAN CENTRAL RAILROAD:
Franks, E. A., City Purchasing Agent.

NASSAU STREET RAILWAY CO.:
Ewing, M. C., Vice-President and General Manager.

NORTH KANKAKEE ELECTRIC LIGHT & RAILWAY CO.:
Durfee, Sidney, Manager.

OTTAWA, RIDEAU LAKES & KINGSTON RAILWAY:
Upson, U. L., General Manager.

PAGE COUNTY LIGHT, HEAT & POWER CO.:
Bonnell, C. M., General Manager.

PORT ARTHUR & FORT WILLIAM ELECTRIC RAILWAY CO.:
Elbridge, Thomas, Assistant Superintendent.

PUBLIC UTILITIES CO.:
Parker, B. E., General Superintendent.

WAUSAU STREET RAILROAD CO.:
Rasmussen, Nels, Assistant Superintendent.

OTHER GUESTS

Buckley, M. C., Traction Expert, Chicago, Ill.

Burrows, Acton, Secretary, Canadian Street Railway Association, Toronto, Ontario, Canada.

Dunlap, G. W., Public Service Commission, 1st District, New York, N. Y.

Gansey, O. H., Traffic Inspector, Board of Supervising Engineers, Chicago, Ill.

Knight, C. C., Manager, Western Pacific Developments, Vancouver, B. C.

Witt, Peter, City Street Railway Commissioner, Cleveland, Ohio.

Lund, Eugene N., Street Railway Inspector, City of Minneapolis, Minneapolis, Minn.

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MINUTES

OF THE

1912 CONVENTION

MONDAY AFTERNOON SESSION

OCTOBER 7, 1912

The fifth annual convention of the American Electric Railway Transportation and Traffic Association was called to order, President Shannahan presiding, at 2.45 P. M. on Monday, October 7, 1912, in the Blue Room of the Saddle and Sirloin Club.

PRESIDENT SHANNAHAN:— Gentlemen, the meeting will be in order.

The first order of business is the address of the President.

ADDRESS OF THE PRESIDENT

This meeting marks the beginning of the Fifth Annual Convention of the youngest of the affiliated associations — the "T. & T." In these past few years much good work has been accomplished. In the earlier days of association work the greater part of the Convention time was spent in the reading of papers to which some man had given much time and thought, but to which I regret to say, but scant attention was paid. To-day almost the entire time of the Association in Convention is given to the reading and discussion of the reports of standing committees. A committee of six, embracing geographically, as nearly as possible the entire country, having spent nearly a year in research and careful investigation, brings to the attention of the Association the results of its work, with, in most cases, definite recommendations. In January, 1908, President Allen created five committees; to-day we have fourteen. This illustrates very clearly the growth in volume and breadth of the work being done by this Association.

The number of committees has made necessary the reading of certain of the reports by title only, in order that there remain sufficient time for the discussion of these reports. Your Executive Com-

EDITOR'S NOTE—A complete list of the names of those who participated in the discussions at the various meetings of this Convention, together with their official titles, will be found on page 413.

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mittee believed that placing the printed copies of the reports in the hands of the members a sufficient time before the Convention would overcome any objection to this change.

Ten years ago, when the Engineering Association held its first meeting, it was confronted by the greatest diversity in the practice of engineering as applied to the electric railway industry. Since that time they have done a great work in the standardization of material. This was well illustrated by Mr. Gove in his notable article in the September AERA, in which he states that the use of the brake-shoe standards created by the Engineering Association had enabled his company to save $30,000 per annum on this one item alone.

Since the organization of the Transportation and Traffic Association it has done much excellent work in the standardization of methods, particularly in the adoption of standard codes of rules for the government of both city and interurban lines. That much along this same line yet remains to be done is clearly indicated by the Committee reports now in your hands. I am convinced that in no one respect can this Association accomplish more for its branch of the industry than by the standardization of methods, and I strongly urge the Association and the incoming Executive Committee to take vigorous steps to this end.

Included in the fourteen standing committees are five joint committees, viz.: two with the Engineering Association, Block Signals and Train Operation; two with the Accountants', Fares and Transfers and Statistical Unit; and one with the Claim Agents, Training of Transportation Employees. I allude to this feature of joint committees where the work of the Associations overlap, only as an indication of the cordial relations existing. Of the above committees two are new, namely, those on Train Operation and Statistical Unit, and the Committee on Definitions is also a new one.

The present practice of confining the attention of the Association in convention to the discussion of committee reports has practically eliminated the work formerly done by the Committee on Subjects. In view of this condition, I recommend the elimination of this committee from the list of standing committees.

Several times during the past few years, in discussing in convention the report of the Committee on Interurban Rules, it has been suggested that representatives of this Association confer with representatives of the American Railway Association, to the end that the respective codes of rules be brought into closer agreement. Two years ago Mr. J. W. Brown, then chairman of the Committee on Interurban Rules, had some correspondence with Mr. Rice, chairman of the Committee on Transportation, of the American Railway Association, in an effort to procure a conference. Mr. Rice wrote very frankly, saying he felt that such a conference would be fruitless. Several months ago General George H. Harries took the matter up with Mr. Daniel Willard, president of the American Railway Association, with the result that Mr. Rice wrote me, under date of July 16th,

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that he would be glad to have present at the next meeting of the Committee on Transportation a representative of this Association, and would later advise me of the date of meeting. Having heard nothing further from him I assume the Committee has not as yet held a meeting.

It is a source of genuine gratification to me to announce that through the efforts of Mr. Alexander Shane the Indiana Commission has adopted as standard the code of interurban rules as amended by the present Committee on Interurban Rules.

I wish to make grateful acknowledgment at this time of the results of the campaign for individual members carried on by the committee composed of Mr. H. A. Nichol, Mr. Henry E. Reynolds and Mr. P. P. Crafts.

During the past year, and largely through the efforts of President McCarter, Mr. Arthur Brady and Mr. H. C. Donecker, there has been inaugurated the publication of the AERA. The purposes sought to be accomplished were well set forth by Mr. Brady in the first issue. That it will greatly aid in furthering the aims of the Association is generally conceded, and I bespeak for it the generous support of all our members. The Question Box will prove to many an attractive feature, and I hope every man will give of his knowledge and experience to make this department more interesting and helpful.

One thing I desire to call to the attention of the incoming president of this Association, is the great desirability of appointing the committee chairmen as soon after this convention as possible. In the years past it has been November before these appointments have been made and this seriously shortens the time available for the work of the committees, as their reports must be in the hands of the Secretary by the middle of July. At the first meeting of the Executive Committee, subsequent to the Convention, the work to be done by the standing committees is determined, and it would prove very desirable to have the chairmen of these committees in attendance at the first meeting of the Executive Committee.

I will not attempt to speak separately of the reports of the various committees to be presented at this Convention, reserving such comment as I care to make for the reports as presented. But I can take this opportunity of saying that I believe you will find the work to have been well done. I am glad to make acknowledgment to those men who have so willingly given of their time to make the work of this Association successful. To the members of the Executive Committee my especial thanks are due. If the success of this Association is due to one man more than to any other, then the one man is our splendidly efficient Secretary, Mr. H. C. Donecker.

In conclusion, let me urge the members to be prompt in attending the sessions at this Convention, and to freely discuss the reports to be presented.

PRESIDENT SHANNAHAN:—The next business to come before this meeting is the report of the Executive Committee, which the Secretary will present.

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ANNUAL REPORT OF THE EXECUTIVE COMMITTEE

MINUTES OF THE MEETING OF THE EXECUTIVE COMMITTEE OF THE AMERICAN ELECTRIC RAILWAY TRANSPORTATION AND TRAFFIC ASSOCIATION, HELD AT THE ASSOCIATION HEADQUARTERS, 29 WEST 39TH STREET, NEW YORK, N. Y., MONDAY, NOVEMBER 27, 1911.

The meeting was called to order by President Shannahan at 10:15 A. M.

Those present were: J. N. Shannahan, president, president, Pottsville Union Traction Co., New York, N. Y.; Dana Stevens, first vice-president, vice-president and general manager, The Cincinnati Traction Co., Cincinnati, Ohio; A. Gaboury, superintendent, Montreal Street Railway Co., Montreal, Que.; C. B. Buchanan, general manager, Virginia Railway & Power Co., Richmond, Va.; H. A. Nicholl, general manager, Indiana Union Traction Co., members of the Executive Committee; J. Stanley Moore, chairman, Committee on Passenger Traffic, general passenger agent, Syracuse, Lake Shore & Northern Railroad, Syracuse, N. Y.; H. E. Reynolds, chairman, Committee on Express and Freight Traffic, assistant general manager, Bay State Street Railway Co., Boston, Mass.; W. O. Wood, chairman, Committee on Construction of Schedules and Time-tables, president, New York & Queens County Railway Co., Long Island City, N. Y.; H. W. Fuller, general manager, Washington Railway & Electric Co., Washington, D. C., and H. C. Donecker, secretary.

The reading of the minutes of the meeting of October 10, 1911, was dispensed with, and, on motion, duly seconded and carried, ordered approved.

The next subject considered was the motion adopted at the Atlantic City Convention to the effect that the reading of all reports and papers be dispensed with and that the entire time of Convention sessions be devoted to discussion of such reports and papers, which, as heretofore, should be placed in the hands of the member companies a sufficient length of time in advance of the Convention to enable the delegates to familiarize themselves with same. After full discussion, the following motion was approved:

> "That lengthy papers or reports of such a character as cannot be readily understood and digested from a first reading at a public meeting be sent out individually to member companies and specific attention called to the importance of the subject; that information be given at the same time to the official to whom the paper or report is sent, that it will not be read in full at the Convention session, and such official requested to have a delegate of his company, who will be present, instructed to read the paper or report in advance and be prepared to discuss the same, the president and secretary to have power to decide which papers shall be read in full and which in abstract form.

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"Further, that the secretary call specific attention to papers or reports that, in his judgment, will particularly interest the individual company, such papers or reports to be sent out separately from other advance papers."

The matter of the personnel of the various committees of the Association was taken up and President Shannahan submitted a tentative list of officials to hold such places. After complete discussion, this list, in revised form, was approved.

The Committee then took up the matter of the work to be carried on by the respective committees during the current year, that of the Committee on City Rules being the first considered, with final instructions as follows:

(a) That the matter of rules for prepayment cars be further investigated.

(b) That the Committee be instructed to hold a joint meeting with the Committee on Interurban Rules and attempt to harmonize conflicting rules in the two codes, this meeting to be held, if possible, just prior to the mid-year meeting of the Executive Committee.

(c) That the Committee be instructed to collect information on legislative and commission rulings with regard to rules for city operation.

The work of the Committee on Interurban Rules was next taken up and plans developed as follows:

(a) That the Committee be instructed to hold a joint meeting with the Committee on City Rules and attempt to harmonize conflicting rules in the two codes, this meeting to be held, if possible, just prior to the mid-year meeting of the Executive Committee.

(b) That the Committee be instructed to collect information on legislative and commission rulings with regard to rules for interurban operation.

(c) That the Committee be instructed to confer with a committee of the American Railway Association and attempt to reach some agreement as to the standardization of rules which affect both steam and interurban operation.

(d) That the Committee be instructed to make a study of and formulate a set of rules for block signal operation.

In connection with the personnel of the Committee on Interurban Rules, some attention was given to a suggestion that the membership be increased to fifteen, with the result that it was declared to be the sense of the meeting that it is undesirable to increase the present membership of six. It was also moved, seconded and carried, where

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practicable and to the interest of the Association, at the discretion of the president, that at least 50 per cent. of the members of the old committee be retained in the next succeeding year; such plan to also apply to the membership of the Committee on City Rules.

The Committee then discussed various means of bringing about a more general adoption of both the city code and the interurban code by the member companies, and, on motion, duly seconded and carried, it was decided to request Mr. Thos. N. McCarter, president of the parent Association, to communicate with the member companies, calling attention to the development and the adoption of these codes by the Transportation and Traffic Association, and their subsequent approval by the American Association, and requesting information as to what, if any, action had been taken by the member companies in regard to the adoption of the codes, and, if not so adopted, the reasons therefor.

The work of the Committee on Training of Transportation Employes was then taken up and the following suggestions for its work, approved:

(a) The development of uniform records for use during the breaking-in period.

(b) A study of the minimum breaking-in period for both the city and interurban lines.

(c) The development of forms for permanent record of employees.

(d) A study of state or municipal regulations which affect the employment of trainmen.

(e) Merit and demerit system.

(f) The matter of the payment of bonuses to trainmen.

(g) Training of employees for interurban work.

In addition, the committee was instructed to communicate with the Claim Agents' Association, requesting that that Association delegate a committee of claim agents of member companies to meet with our committee to discuss that portion of the work of the training of transportation employees in which the two Associations may have mutual interest.

Plans for the Committee on Express and Freight Traffic were then considered, and, in addition to suggestions offered by Mr. H. E. Reynolds, chairman of the Committee, the Executive Committee approved the following as lines which the Committee should follow this year:

(a) Investigation of laws, franchise conditions, etc.

(b) Investigating of methods of promoting business.

(c) Advertising.

(d) Literature, etc.

(e) Standard method of fixing charges for carrying newspapers.

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In addition, at the request of Mr. Reynolds, chairman, the secretary was instructed to send a communication to member companies, inviting suggestions as to subjects having to do with this branch of the business which the Committee might investigate in addition to those named above.

It was the belief of the Committee that the development of the work of the Committee on Express and Freight Accounting should be left to the judgment of the co-chairmen, with the exception that the Committee be instructed to investigate fully the merits or demerits of the ton-mile unit.

With regard to the Committee on Passenger Traffic, the Executive Committee discussed plans by which the scope of the work of this Committee could be extended, and, as a result of this, the following topics were approved and assigned to the committee for consideration:

(a) Chartered car tariffs.
(b) Winter resorts.
(c) Summer resorts.
(d) Interline business with steam railroads.
(e) Tourist business.
(f) Distribution of the peak load.
(g) Mileage ticket books (unrestricted).
(h) Value of increasing the number of limited cars.
(i) Number of stops for limited cars in towns and cities.
(j) Extra fare cars.

It was then moved, seconded and carried, that a committee be appointed to define terms commonly used in the transportation departments of electric railways and that subsequently an effort be made to bring about the uniform adoption of such definitions with a view to standardization.

The matter of numbering the revised code of city rules was then considered with the final determination that a definite block of numbers be assigned to each section of the code and that a sufficient number of blanks be left for the insertion of local rules.

The meeting was then adjourned, reconvening at three o'clock in the afternoon, with President Shannahan in the chair.

The first subject considered was that of plans for the Committee on Construction of Schedules and Time-tables, with the result that the following topics were assigned to this Committee:

(a) Rules for misses.
(b) Car house records.
(c) Boards showing seniority and working lists.
(d) Method of keeping the time of trainmen.
(e) Forms of detention reports.
(f) Investigation of the practice governing meal times.

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(g) Classification of trains and information to be shown on time-tables, such as speed limits in municipalities, stop numbers and locations, distance between stops and designation of cars that carry mail pouches.

With regard to the last subject, it was the judgment of the Committee that no rules should be included in the time-tables, inasmuch as such practice tended to minimize the importance of rules not so shown.

The work of the Joint Committee on Block Signals for Electric Railways was discussed, but no further instructions seemed to be necessary other than the work outlined in the report of the Committee to be done during the present year. These recommendations were as follows:

(a) Recommendations for signaling single track suburban railways, headway between five and thirty minutes, speed not exceeding twenty miles per hour.

(b) Recommendations for signaling single track interurban railways, headway one to ten minutes, speed not exceeding thirty miles per hour.

(c) Recommendations for signaling single track interurban railways, headway not less than one hour, speed forty to sixty miles per hour.

(d) Recommendations for signaling single track interurban railways, headway as frequent as fifteen minutes with trains in several sections, speed forty to sixty miles per hour.

(e) Recommendations for signaling double track interurban railways, headway as frequent as five minutes and speed forty to sixty miles per hour.

The matter of having this Committee consist of ten members instead of six, as at present (a suggestion advanced by the Executive Committee of the Engineering Association), was considered at some length with the final result that the suggestion was not approved.

The Committee then took up the question of the work of the Committee on Fares and Transfers. The discussion brought out the great importance of the work of this Committee, which has to do with methods of taking care of the collection and registration of all classes of fares, methods which have not been improved as have methods, equipment and practice in every other branch of electric railway work. It was the sense of the meeting that this Committee should make a general study of the subject, the exact line of work to be determined by the chairman of the Committee.

It was moved, seconded and carried, that a special committee be appointed to act with the Engineering Association to consider the question of multiple-unit operation for both city and interurban lines.

It was moved, seconded and carried, that a special committee be

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appointed to take up the question of the development of an operating unit which would offer a proper basis for comparisons of operating results. Mr. C. B. Buchanan, general manager, Virginia Railway & Power Company, Richmond, Va., accepted the chairmanship of this committee, the object of which is shown in the following motion, which was duly approved:

> "Moved, that the president appoint a committee of three to investigate the subject of arriving at a proper unit for car operation and report at the next annual Convention, this committee to co-operate with a similar committee from the Accountants' Association."

The matter of progress reports was then considered and it was decided to request all chairmen to so report at a meeting of the Executive Committee, to be held in January, during the period of the mid-year conference of the American Electric Railway Association.

On motion, duly seconded and carried, the meeting then adjourned.

Respectfully submitted,

H. C. DONECKER,
Secretary.

J. N. SHANNAHAN,
President.

MINUTES OF THE MEETING OF THE EXECUTIVE COMMITTEE OF THE AMERICAN ELECTRIC RAILWAY TRANSPORTATION AND TRAFFIC ASSOCIATION, HELD AT THE ASSOCIATION HEADQUARTERS, 29 WEST 39TH STREET, NEW YORK, N. Y., SATURDAY, JANUARY 27, 1912.

The meeting was called to order at 10:30 A. M., with President Shannahan in the Chair.

Those present were: J. N. Shannahan, president, president, Pottsville Union Traction Co., New York, N. Y.; Dana Stevens, first vice-president, vice-president and general manager, The Cincinnati Traction Co., Cincinnati, Ohio; M. C. Brush, third vice-president, assistant to vice-president, Boston Elevated Railway Co., Boston, Mass.; H. A. Nicholl, general manager, Indiana Union Traction Co., Anderson, Ind.; member of the Executive Committee, H. C. Page, past president, general manager, Worcester Consolidated Street Railway Co., Worcester, Mass., and H. C. Donecker, secretary. W. R. W. Griffin, chairman of the Committee on Schedules and Time-Tables, general manager, Tri-State Railways & Electric Co., East Liverpool, Ohio; J. Stanley Moore, chairman of the Committee on Passenger Traffic, general passenger agent, Syracuse, Lake Shore & Northern R. R. Co., Syracuse, N. Y.; W. H. Sawyer, co-chairman of the Joint Committee to Consider Multiple-Unit Operation for Both City and Interurban Lines, with Ford, Bacon & Davis, New York, N. Y., and General Geo. H. Harries, first vice-president of the American Association also met with the Committee.

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The first matter considered was that of the approval of the minutes of the meeting of the Executive Committee held in New York on Monday, November 27, 1911. These having previously been sent to the members of the Committee, were declared approved without being read.

The next order of business was the consideration of applicants for associate membership alliance with the Transportation and Traffic Association. Upon motion, duly seconded and carried, the following were accepted as members of the Transportation and Traffic Association:

Baurhenn, L. P., Division Supt., Public Service Railway Co., Edgewater, N. J.

Beatty, Daniel, Supt. of Trucking, Public Service Railway Co., Jersey City, N. J.

Bliss, A. J., Supervisor, Public Service Railway Co., Jersey City, N. J.

Cameron, J. R., Inspector, Public Service Railway Co., Paterson, N. J.

Dean, M. H., Clerk, Public Service Railway Co., East Orange, N. J.

Donlin, J. F., Supervisor, Public Service Railway Co., Jersey City, N. J.

Dougherty, P. K., Starter, Public Service Railway Co., Paterson, N. J.

Downs, J. L., Chief Clerk, Transportation Department, Public Service Railway Co., Newark, N. J.

Engle, J. L., Station Master, Public Service Railway Co., Paterson, N. J.

Haselmann, Eugene, Inspector, Public Service Railway Co., Paterson, N. J.

Herflicker, D. H., Supervisor, Public Service Railway Co., Camden, N. J.

McCullough, A. P., Supervisor, Public Service Railway Co., West Hoboken, N. J.

Mattimore, E., Supervisor, Public Service Railway Co., Newark, N. J.

Pierce, D. T., McGraw Publishing Co., 239 West 39th street, New York, N. Y.

Ramsey, W. J., Superintendent of Employment, Public Service Railway Co., Newark, N. J.

Shepherd, W. H., Chief Clerk, Time-table Department, Public Service Railway Co., Newark, N. J.

Smith, O. E., Inspector, Public Service Railway Co., Paterson, N. J.

Stone, Geo., Division Superintendent, Public Service Railway Co., Paterson, N. J.

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Sturms, J. F., Supervisor, Public Service Railway Co., Newark, N. J.

Suter, John, Inspector, Public Service Railway Co., Paterson, N. J.

Torbert, J. T., Supervisor, Public Service Railway Co., Newark, N. J.

Van Name, Capt. E., Superintendent of Ferries, The Riverside & Fort Lee Ferry Co., Edgewater, N. J.

Williams E. L., Division Superintendent, Public Service Railway Co., Jersey City, N. J.

Williams, R. T., Assistant Supervisor, Public Service Railway Co., Jersey City, N. J.

There then followed a general discussion of the matter of associate membership, it being pointed out that there is allied with the Engineering Association 60 per cent. of the present enrollment of individual members, with advantageous results to that Association in work accomplished, interest in contributions, attendance at meetings and discussions on the floor of the annual conventions. Attention was also directed to the fact that the transportation departments of the railways offer an extensive field for individual membership, both numerically and because of the close association of this department with the patrons of the companies, the cultivation of whose good regard is one of the objects of this Association and a work in which the associate members must play a leading part. Finally, the President was authorized to appoint a committee of three to take up the subject of the enrollment of associate members among officials and others connected with the transportation and traffic departments of member companies.

The Committee then received progress reports from various committees which had met during the mid-year conference week, as follows:

REPORT OF THE COMMITTEE ON SUBJECTS

This Committee recommended, in view of the large number of Committee reports, that the program for the 1912 Convention contain but one paper the subject of which to be that of one-man car operation, the title of the paper and the speaker to be left in the hands of the President. Some discussion then followed as to the necessity for the continuance of the Committee on Subjects, and it was finally determined that because of the fact that the Executive Committee now outlines in considerable detail the work of the various standing and special committees, the duties left to the Committee on Subjects were not sufficient to warrant its further existence, and on motion duly approved it was ordered that this Committee be discharged at the conclusion of the present fiscal year.

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REPORT OF THE COMMITTEE ON CITY RULES

This Committee reported as follows:

A meeting was held at the Association headquarters on Thursday January 25th, at which were present: E. F. Peck, chairman, W. B. Rockwell and W. A. Heindle.

The following matters recommended by the Executive Committee were fully discussed and action taken as hereinafter indicated:

(a) Investigation of rules for prepayment cars.

The chairman was authorized to prepare a data sheet to be sent to member companies to secure information on this subject, the distribution of such inquiries to be confined to companies using prepayment cars.

(b) The harmonizing of conflicting rules in the city and interurban codes.

A joint meeting with representatives of the Committee on Interurban Rules was held to discuss this matter and a committee of two, consisting of Mr. W. B. Rockwell, of the Committee on City Rules, and Mr. J. J. Doyle, of the Committee on Interurban Rules, was appointed to compare the codes with a view to developing inconsistencies, subsequently reporting back to their respective committees.

(c) Collection of data on legislative and commission rulings affecting rules for city operation.

The Committee, with the assistance of the Secretary of the Association, will attempt to gather data of this character.

This report was, on motion duly seconded and carried, approved and the Committee instructed to consider such further revision of the present code as would appear to be necessary, after the receipt of replies from member companies to the following letter from Mr. Thomas N. McCarter, president of the American Electric Railway Association:

GENTLEMEN:

I am having sent you, under separate cover, copies of the standard code of rules for city and interurban operation adopted by our affiliated Transportation and Traffic Association and approved by the American Electric Railway Association.

The desirability of standard operating rules is obvious, and it is the object of this Association to so perfect its codes that they may be generally adopted by the members. To the end that we may know what progress is being made in this direction, we would ask that you indicate whether either or both of the codes have been put into use on the lines of your Company, or if such action is contemplated. If not, a statement of your objections to the code is desired.

An expression from member companies as to defects or inadequacies, if any, will be of much assistance in the ultimate development of codes that will adapt themselves to the needs of the industry at large.

Your prompt attention will be appreciated.

January 23, 1912.

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REPORT OF THE COMMITTEE ON INTERURBAN RULES

This Committee reported as follows:

Due to illness in his family, Mr. C. F. Handshy, chairman, was unable to be present, and the Committee was represented only by Mr. W. H. Collins and Mr. J. J. Doyle, who considered the recommendations of the Executive Committee more or less informally. These gentlemen met with the Committee on City Rules, pursuant to instructions from the Executive Committee, and considered the matter of harmonizing the two codes. The result of this meeting is described in the report of the Committee on City Rules above.

REPORT OF COMMITTEE ON EXPRESS AND FREIGHT TRAFFIC

Through Mr. H. E. Reynolds, chairman, the following written report of the Committee was received, and, on motion duly seconded and carried, ordered approved:

The Committee on Express and Freight Traffic was in session at 2:30 P. M., Thursday, January 25th. Present: H. E. Reynolds, chairman, Boston, Mass.; F. W. Coen, Sandusky, Ohio; and J. C. Calisch, Buffalo, N. Y.

We submit herewith two data sheets, one to be used by companies conducting express and freight service, and the other, by those which are not engaged in this class of traffic. It seems advisable to the Committee that two blanks be printed this year, as it has been the experience of former committees engaged in this line of work that they were unable to obtain any data from companies not engaged in the business, as they would usually write across the blank, "Not engaged in this business," and would not follow the line of questions. Therefore, we believe this year we will derive information from companies not engaged in the business, which can furnish certain information relative to franchise matters that the Committee should have in making up its report.

I am also attaching memorandum sheet which covers additional suggestions to be embodied in the data sheet for companies conducting express and freight business.

The Committee has endeavored to follow out the suggestions of the Executive Committee as to line of inquiry to be followed this year and has added to it a number of other questions of importance.

The Chairman saw Mr. A. R. Piper, of Brooklyn, N. Y., another member of the Committee, after the meeting, and he is to look over this sheet and make such suggestions or additions as may occur to him and forward to me.

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(Data Sheet to be sent to companies conducting an express and freight business.)

Company . .....

City . ..... State . .....

RIGHTS TO CONDUCT EXPRESS AND FREIGHT SERVICE

Number of cities and towns in which Company has tracks.
Number of cities and towns in which Company has express and freight rights.
Number of cities and towns in which Company operates express service only.
Number of cities and towns in which Company operates freight service only.
Number of cities and towns in which Company operates both.
Population served by passenger service.
Population served by freight service.
Population served by freight and express service.
Population of cities and towns in which Company has rights but does not operate.
Total miles of track owned.
Number of miles of track over which Company has express and freight rights.
Number of miles of track over which Company operates either express or freight, or both.
Do you operate express and freight cars over lines of other Companies?
If so, please state briefly arrangements as to the same.
Did you obtain your right to do an express and freight business from State or local authorities?
Are you restricted as to kinds of commodities carried?
Are you restricted as to time of day or night you can operate?
Are you restricted as to single car operation?
Is your franchise terminable?
If so, what length of time?

CHARACTER OF BUSINESS

What per cent. of your freight is handled in carload lots?
In handling carload lots, is it done by single car operation, in train, or both?
What facilities have you in the line of labor saving devices, for handling heavy freight at your terminals, docks, or at sidings?
Is there a pick-up and delivery service maintained in connection with your express and freight service?
Do you operate same? Do you find it profitable?
If you do not operate same, what arrangements are made with connecting carriers for this service?
If a pick-up and delivery service is not maintained, kindly state reasons why.
If you maintain an express service, please state what percentage of your total express and freight earnings is derived from this source.
Is your express and freight service amenable to the laws and regulations of the Interstate Commerce Commission?

VOLUME OF BUSINESS AND STATISTICS

What was the gross tonnage of freight and express carried over your lines during the last fiscal year?
Freight and express operation: Receipts per car mile. Expenses per car mile.
Passenger operation: Receipts per car mile. Expenses per car mile.
Freight and express operation: Receipts per car hour. Expenses per car hour.
Passenger operation: Receipts per car hour. Expenses per car hour.
Average rate per 100 lbs. freight service.
Average rate per 100 lbs. express service.
Gross receipts for transporting newspapers.
Gross receipts for transporting milk.

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RATES

Do you use the Steam Road Official Classification?
If not, what system of classification of rates have you in effect?
Upon what basis are your freight rates established?
Upon what basis are your express rates established?
What competition have you in your territory: Freight. Express. Automobile trucks (extent of same).
Quote both your own and steam road class rates between two of your largest shipping points.
Quote both your own and old time express company's rates between your largest shipping points.

PROMOTION OF EXPRESS AND FREIGHT BUSINESS

What methods do you employ in promoting this business?
Please furnish two copies each of all advertising matter; rates, etc., published in connection with this service.
Have you taken any steps toward developing your territory, by locating industrial plants, or settling the farm lands, and if so, to what extent?

EQUIPMENTS

Number of combination passenger and express cars.
Number of box cars (motor).
Number of trailer cars.
Number of baggage cars.
Number of coal cars (flat-bottom, hopper and side-dump).
Number of cinder cars.
Number of locomotives (electric).
List of equipment not otherwise above specified.

PHOTOGRAPHS AND PLANS OF CARS AND TERMINALS

Please furnish photograph of standard express and freight cars.
Please furnish drawings of standard express and freight cars.
Please furnish photograph of typical station.
Please furnish drawings of typical station.

TRANSPORTATION OF NEWSPAPERS

Do you transport newspapers?
On passenger or express cars, or both?
What rate do you charge for same?
Please furnish copies of such record blanks, tickets, etc., used in connection with the same.

MISCELLANEOUS SUGGESTIONS SUBMITTED TO COMMITTEE BY MEMBER COMPANIES

Can an express and freight business be profitably handled by a street railway company operating city lines only, in a city of 500,000 inhabitants? Please state your views fully?
Operating city and suburban lines only.
Does it require the addition of an interurban line or lines to place business on a paying basis?
Effect upon passenger earnings on suburban lines, as a result of maintaining electric line freight service on such lines.
What is the best manner of meeting competition of automobile trucks, with electric line service, within a radius of 20 or 30 miles from a central station?
What is the relative cost of handling merchandise by motor trucks, as compared with electric express and freight cars?
Can companies afford to maintain a pick-up and delivery service, in connection with electric express business?
If so, what rates should be charged?
Should electric railways adopt the steam road classifications?
If not, what suggestions have you to offer in making up a classification to apply to electric road?
Capital invested in express and freight development.
In constructing sidings, spurs or tracks into shippers' plants, for the convenience of the shipper, what proportion of cost does your Company assume?

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(Data sheet to be sent to companies not conducting an express and freight business.)

Company . . ..

City ..... State .....

RIGHTS TO CONDUCT EXPRESS AND FREIGHT SERVICE

Number of cities and towns in which Company has tracks.
Number of cities and towns in which Company has express and freight rights.
Population served by passenger service.
Population of cities and towns where Company has express and freight rights but does not operate.
Number of miles of track owned.
Number of miles of track over which Company has express and freight rights.
If Company has rights to do an express and freight business, please state source of authority from which same is granted.
In the same, are you restricted as to kinds of commodities carried?
In the same, are you restricted as to time of day or night you can operate?
In the same, are you restricted as to single car operation?
Is your franchise terminable? If so, what length of time?
Are you making plans to engage in the express and freight business?
If so, to what extent?
If not, please state fully the reasons which prevent your Company considering installing this class of service.
If you have no authority to conduct an express and freight service, please state as to what steps it would be necessary for you to take in order to obtain such rights.
Briefly outline the State or Municipal laws which govern this matter.

TRANSPORTATION OF NEWSPAPERS

Do you transport newspapers?
What rate do you charge for same?
Please furnish copies of such record blanks, tickets, etc., used in connection with the same.

TRANSPORTATION OF MILK

Do you transport milk?
What rate do you charge for same?

MEMORANDUM OF ADDITIONAL SUGGESTIONS TO BE EMBODIED IN THE DATA SHEET FOR COMPANIES CONDUCTING AN EXPRESS AND FREIGHT BUSINESS

What is your minimum charge, if any, on express matter?
What is your minimum charge, if any, on freight matter?
Do you have any working arrangements with the old line express companies?
If so, please state briefly the working basis and operating conditions, if any.
Are your agents paid a salary or on a commission basis?
If paid a commission, on what basis?

REPORT OF THE COMMITTEE ON CONSTRUCTION OF SCHEDULES AND TIME-TABLES

The Committee reported as below:

The Committee on Construction of Schedules and Time-tables met at the Association headquarters on Thursday, January 25th.

Those present were: W. R. W. Griffin, chairman, J. E. Duffy, C. F. Hewitt, C. E. Morgan and T. F. Grover.

The Committee, after reviewing the topics outlined for it for the coming year, decided that, as the former Committee had

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developed the actual construction of schedules and time-tables to a practical standard, one form for city operation and one for interurban, it could best serve the Association by endeavoring to develop a concise economical method of assuring the proper and accurate carrying out of such schedules. This decision came about from the fact that it developed in the experience of the Committee members, that in some cases at least, particularly in city operation, their records and methods of checking service and trainmen's time were such that they were not sure that their schedules were fulfilled or their time accurate.

With this idea in view, the Committee formulated the following questions concerning which the Secretary is to collect data and information:

RULES FOR MISSES

Rules and discipline for misses.
Do you find same satisfactory?
Suggestions for betterment.

CAR HOUSE RECORDS

What transportation records are kept in car house or station that insure knowledge that schedule is carried out?
(a) Lost trips.
(b) Turn backs short of destination.
(c) Records to show that cars definitely go to end of line or destination indicated on time-table.

BOARDS SHOWING SENIORITY AND WORKING LIST

How is list of seniority kept?
Is this posted for inspection of men at will?
How is working list of extra men kept?
Is this posted at stated time of day?
Send copies of same.

METHOD OF KEEPING TIME OF TRAINMEN

How do you check time?
(a) In case of regular men at relief where run happens to be late and relief is at some point away from barn or station?
(b) In case of trippers or extra runs?
Do you use time clocks?
Do you have men mark time *on* and *off* personally on a sheet?
Do you have a meal relief?
What are the rules governing same?
Do you allow trainmen to eat on car while in motion?
Do you layover for meal?
Please submit copies of working time-tables.

On motion, duly seconded and carried, this report was approved.

REPORT OF THE COMMITTEE ON FARES AND TRANSFERS

This Committee submitted a report as follows, which, on motion duly seconded and carried, was declared approved:

The Committee on Fares and Transfers held a meeting at the Association headquarters at 2 P. M. on Thursday, January 25th.

Those present were: T. C. Cherry, chairman, F. T. Wood, J. J. Dempsey and J. V. Sullivan. Mr. M. R. Boylan, representing the subcommittee of the Accountants' Association, also met with the Committee.

Mr. Cherry designated Messrs. Wood, Sullivan and Dempsey to prepare questions for data sheet for information as to effect on revenue of extension of transfer privilege.

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Mr. Cherry will appoint additional member of the Committee to act with himself in formulating questions for data sheet in reference to interurban systems.

Messrs. Wood, Sullivan and Cherry, of this Committee, will co-operate with Messrs. Boylan, Davies and Huggins of the Accountants' Association, in securing information concerning prepayment cars.

The data sheet will be so prepared that the Committee can make its report by grouping properties as to size and character.

Report of the Committee on Training of Transportation Employees

This Committee submitted a report as follows:

The meeting of the Committee on Training of Transportation Employees was called to order at 11:20 A. M., Thursday, January 25th, chairman Danforth in the Chair.

Those present were: R. E. Danforth, chairman, Bruce Cameron, C. S. Krick, C. E. Learned and Major J. T. Crabbs. Messrs. R. E. MacDougall, H. V. Drown and W. Tichenor, representing the Claim Agents' Association, also met with the Committee.

The object of the meeting was to develop a data sheet to be sent to member companies, and after thorough discussion, the following data sheet was drawn up:

Company .....

City ..... State .....

ORGANIZATION TRANSPORTATION DEPARTMENT

Please furnish chart showing organization in Transportation Department, giving briefly the duties of each class of employees.

SELECTION OF TRAINMEN

Have you any difficulty in securing a sufficient number of men?
If so, why?
What are the requisite qualifications for employment?

INSTRUCTION OF TRAINMEN

What instruction is given in the School Room?
What instruction is given on the School Car?
If neither of the above are used, give description of your method of instruction.
What instruction is given in actual operation of car?
(a) Minimum number of hours allowed for instruction in School Room.
(b) Minimum number of hours allowed for instruction in School Car.
(c) Minimum number of hours allowed for instruction in Actual Operation.
Is platform instruction entirely under supervision of one instructor?
Who finally passes upon a trainman's qualifications before he is assigned to work?
Are trainmen broken-in on one line only, or on all the lines of an entire division?
Do you have a probationary period during which time a man works for himself and before the completion of which he is permanently appointed?
Do you have a probationary period, that is, a period following breaking-in period where the man is under supervision and at the end of which time an examination is given to determine his fitness for the work?
If so, describe fully.

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SUPERVISION OF TRAINMEN

What method of supervision is employed to see that an employee properly performs his duties?
(a) During probation period.
(b) After permanent employment.
What methods are employed on the line by supervisors to correct violations?
Are violations called to the attention of the trainmen while on duty, in the presence of passengers, or when off duty?
Are such violations reported to superintendent?
What measures, if any, are taken to continue the instruction of qualified men who continue to violate instructions?

HANDLING OF TRAINMEN

DISCIPLINE.

Do you discipline by suspension?
Do you discipline by placing on extra list?
Do you use the so-called Merit and Demerit System?
If the above are not followed exclusively, please describe your methods.
If Merit and Demerit System is followed, please give details of system (with printed matter, if any), when instituted, and your opinion as to value of results obtained; also a statement of the attitude of the employees toward the system.
What official or officials are held responsible for the application of discipline?
Have you a schedule of penalties for stated infraction of rules?
In cases of discharge, who finally passes upon same?
Are men ever re-employed more than one time; if so, what limit is placed upon number of times?

BONUS SYTEM

Has your company now in effect, or has it had any experience with bonus systems of any kind?
If so, please give the details, the date instituted and the results.
Also state whether your company provides free uniforms or engages in other practices which would be in the nature of donations.
If you have in vogue any welfare, sick benefit, insurance or pension system, please describe.

RECORDS

Submit samples of blanks used in the selection, appointment, assignment and instruction of new men.
In addition, please furnish such additional blanks as are used in maintaining permanent records of employees with a brief description of how they are used, together with any other information you may have on the subject.

LAWS AND REGULATIONS AFFECTING TRAINMEN

Submit copies of city or state laws or regulations which have to do with the employment or service of trainmen.

STATISTICS OF LENGTH OF SERVICE

Average number of employees for fiscal year.
(a) Regular motormen.
(b) Extra motormen.
(c) Regular conductors.
(d) Extra conductors.
Number of conductors and motormen hired first six months of fiscal year.
Of these men, how many were in the employ of the company at the end of the first six months of the fiscal year?
How many failed to report for instructions?
How many failed to qualify after instruction?
How many failed to report for work after qualifying?
How many resigned or left during instruction period?
How many were dismissed during instruction period?
How many were actually assigned to duty after qualifying?
How many resigned or left during probationary period, if you have such a period?
How many were discharged during such probationary period? Causes.
How many were accepted as *bona fide* employees after probationary period?
How many resigned after such acceptance and before end of fiscal year?
How many were discharged after such acceptance and before end of fiscal year?

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Total number of trainmen hired during calendar year.
Total number of discharges and resignations among trainmen, both old and new, during calendar year. General causes.
Average years of service of all trainmen, excluding first year men.
(a) If possible, analyze by number of men by years from one to five with one total for all men over five years' service.

This report was given considerable attention and after full discussion, was, on motion duly seconded and carried, unanimously approved.

Report of the Joint Committee on Block Signals for Electric Railways

This Committee submitted the following report, signed by Mr. C. D. Emmons, co-chairman, which, on motion, duly seconded and carried, was approved:

The Joint Committee on Block Signals for Electric Railways met at the Association headquarters on January 25th, the meeting being called to order at 2:20 P. M.

The full Committee was present, as follows: J. M. Waldron, chairman, C. H. Morrison and John Leisenring, representing the Engineering Association, and C. D. Emmons, vice-chairman, C. F. Conn and B. E. Merwin, representing the Transportation and Traffic Association.

Mr. C. H. Morrison was appointed secretary.

The work preparatory to the report to be submitted at the next Convention was subdivided as follows:

Messrs. Leisenring and Merwin to take up with the signal companies the questions and recommendations contained in the report of 1911.

Mr. Emmons to prepare a data sheet and to submit it to the Committee at its next meeting; also to complete the "Index on Articles on Electric Railway Signaling and Related Subjects."

Mr. Conn to obtain and present the late rulings of all State and Interstate Railroad Commissions on the subject of signals.

Mr. Waldron to bring up to date the report on the latest developments and progress in signaling and signal apparatus.

Messrs. Waldron and Morrison to present such standards as to signals in general as should be adopted.

It was arranged that the next meeting of the Committee should be held in Chicago during the week of the meeting of the Railway Engineering Association and the Railway Signal Association, this being the second week in March.

Report of the Committee on Passenger Traffic

Mr. J. Stanley Moore, chairman, submitted the following report of a meeting held in Cleveland, Ohio, on January 22d. This, on motion duly seconded and carried, was approved.

The Committee on Passenger Traffic met at the Hollenden Hotel, Cleveland, Ohio, on Monday, January 22.

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Those present were: J. Stanley Moore, chairman, Frank Caum, N. W. Bolen, J. E. Gibson and F. G. Buffe.

The following topics, as approved and assigned to the Committee by the Executive Committee of the Transportation and Traffic Association, were discussed and subdivided under various heads. Questions relative to each subject were formulated and recommendation made that printed copies of each topic and questions under each be sent out by the secretary of the Association to the various member companies in order that the information so gained might be embodied in the annual report to be submitted at the time of the annual Convention.

It seemed best that various subjects should be assigned to separate members of the Committee, making each member responsible for one or more subjects.

CHARTERED CAR TARIFFS (INTERURBAN)

Do you operate chartered cars?
To what extent?
On what basis are your chartered car rates figured?
Time rate, seat rate, ticket rate, mileage rate.
What restrictions as to service? (Sundays, holidays, after hours.)
Decorations on outside of cars, bands, etc.
What special effort do you make to secure this kind of business?

EXTRA FARE CARS — DINING — SLEEPING — CHAIR — FUNERAL

Cost; operation; results.
Do you use special equipment (private cars)?
If so, what extra charge?
On what basis do foreign chartered cars operate over your lines?
Mileage or cash allowance for operation of foreign car and crew.
To what extent are your rates affected by commissions?

Assigned to Mr. Buffe.

INTERLINE BUSINESS WITH STEAM RAILROADS — TOURIST, BUSINESS, RATES, INDUCEMENTS, ETC.

Assigned to Mr. Caum.

DISTRIBUTION OF PEAK LOAD

Factory closing — hours.
Co-operation between managers of amusement resorts and railroad officials.
What provision for continuance of street car service when interrupted by street parade.

Assigned to Messrs. Bolen and Gibson.

VALUE OF INCREASING THE NUMBER OF LIMITED CARS AND NUMBER OF STOPS FOR LIMITED CARS IN TOWNS AND CITIES

Assigned to Mr. Moore.

CHARTERED CARS CITY SERVICE

Do you operate chartered cars?
To what extent?
On what basis are your chartered car rates figured?
Time rate, seat rate, ticket rate, mileage rate.
What restrictions as to service?
(Sundays, holidays, after hours.)
Decorations on outside of cars, bands, etc.
What special effort do you make to secure this kind of business?

COLONIZATION

Assigned to Mr. Ford and Mr. Caum.

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Report of the Joint Committee to Consider Multiple-Unit Operation for Both City and Interurban Lines

Mr. W. H. Sawyer, co-chairman, submitted the following report of this Committee:

The Joint Committee on Multiple-Unit and other two-car train operation for city service met at the Association headquarters on Thursday, January 25th. This title is changed to eliminate the consideration of interurban service and include trailer car operation. The work is not to be divided between the two committees, but handled jointly by both.

Those present were: H. H. Adams, co-chairman, H. A. Benedict and John Lindall, representing the Engineering Association; W. H. Sawyer, co-chairman, P. N. Jones and M. D. Kilbridge, representing the Transportation and Traffic Association.

It is intended to confine the Committee's work to congested city service with schedule speeds of approximately 8 m. p. h. and 8 stops per mile. Comparisons are to be made between single car operation, multiple-unit operation in two-car trains, and trailer operation. Weights of car bodies are to be practically the same in every car. The Committee questions whether there is now multiple-unit apparatus manufactured which is satisfactory for this work, but expects that the manufacturing companies will supply the demand, if its investigation shows the advisability of such operation. The Committee believes that this is a live topic which will be the subject of much discussion in the near future.

Attached is a skeleton outline of method of studying this subject. This outline was drawn up before the Committee meeting, but was not materially changed, except as outlined above.

(OUTLINE.)

Assume for comparison of cars and complete equipments:

A1–2 motor-65 hp., 8 stops p. m., 8 m. p. h. with equipments with air brakes and K control.

A2–2 motor-65 hp., 8 stops p. m., 8 m. p. h., with equipments with air brakes and complete M. U. apparatus situable for 2-car train operation.

A3–4 motor-50(?) hp., 8 stops p. m., 8 m. p. h., with equipments with air brakes and K control.

A4–4 motor-50(?) hp., 8 stops p. m., 8 m. p. h., with equipments with air brakes and complete M. U. apparatus suitable for 2-car train operation.

A5– Trailers to be used with motor cars equipped with 4–40(?) hp. motors and K control — weights to be such that motors are only normal rating for motor car alone.

A6– Trailers to be used with motor cars equipped with 4–50(?) hp. motors and K control — weights of trailer and motor car to be such that motor car will pull trailer all day without *unduly* heating the motors.

Comparisons to be made between A1, A2, A3, A4, A5 and A6.

B1– Type of car suitable. (This to be a very general study, not taking up details any more than is necessary for comparisons; this subhead being necessary mainly on account of a different entrance and exit probably being advisable for 2-car operation as compared with single car operation with front and rear entrances, also consider car for single end operation.)

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B2– Type of control used. (Type and details of control for M. U. cars is to be most carefully investigated; M. U. control to be figured on to be as *simple*, low priced and light as practicable, considering maintenance costs; such M. U. not necessarily to be in details like any now on the market, but to be the best that the manufacturing companies could design and build, if they should receive an order for several hundred equipments and believed that the success of these equipments meant the equipment of many city roads throughout the country.)

B3– Air brakes.

B4– Other equipment such as couplers, fenders, etc. (This also to be a very general study but thorough enough to be sure that equipment considered will be satisfactory for purpose intended.)

Note:— The control or other equipment as manufactured by any particular company is not to be recommended or reported against, and general statements only are to be made in connection with equipment.

Comparisons B1, B2, B3 and B4 to be made in regard to:

C1– First cost — on which interest, depreciation, taxes and insurance shall be figured; all costs to be installed cost, car complete ready for service.

C2– Weight — on which power cost to carry same around shall be figured.

C3– Maintenance.

C4– Reliability.

C5– Simplicity.

The above comparisons are all to be on a "per car," a "per car mile" or a "per passenger" basis.

Concrete examples are then to be taken of A1 to A6, using the M. U. and trailer cars in 2 or possibly 3 car trains over all or portions of route for all or a portion of day, as is practicable on example assumed.

Service to be considered is:

D1– Single car operation with tripper service during rush hours.

D2– Single car operation over portion of route and train operation over portion of route.

D–3 Congested routes where headway will allow train operation during the greater portion of the day.

D–4 Emergency service — abnormally heavy service.

D–5 Different combinations of D1, D2, D3 and D4.

In these concrete examples comparisons are to be made for D1 to D5 of:

E–1 Transportation expense — platform wages, general effect on "extra" list and apportionment of runs.

E–2 Public Service — especially taking into account to what extent the revenue per car mile would increase or decrease, also considering the indirect financial results of the different service resulting from increased headway, passengers alighting further from cross walks, possible jerking between cars in train, etc.

E3– Power costs per car mile — taking into account weight (C2) and difference in power consumption with one and two-car trains.

E–4 Accident claims.

Conclusions:

F–1 Financial conclusions.

F–2 General desirability.

Considerable discussion then followed as to the scope of the work of this Committee, with the final determination that the present title of the Committee be maintained and that the members of the Committee be increased by the addition of two men who would, under the direction of the present chairman, consider interurban practice, one of these men to be appointed by the Transportation and Traffic Association and the other to be a representative of the Engineering Association, whom Mr. Ackerman will be requested to appoint.

The report of the Committee, except as it is changed by the above recommendations, was thereupon approved.

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REPORT OF THE JOINT COMMITTEE ON A STATISTICAL UNIT FOR CAR OPERATION

This Committee reported that a meeting had been held on January 25th, at which were present: C. H. Lahr, co-chairman, and C. S. Mitchell, representing the Accountants' Association, and C. B. Buchanan, co-chairman, and Nathan H. Daniels, Jr., representing the Transportation and Traffic Association. The following proposed circular letter and form of data sheet, to be sent to member companies, were submited, and, on motion duly seconded and carried, this report was approved.

Gentlemen:

As some of the changes suggested in statistical units are radical, it is urgently requested that all the companies assist the Committee by giving their ideas in full. The Committee is not prepared to recommend departures from the established units of the car mile and car hour unless it is assured that the companies need additional units in order to analyze their operations more closely. Whatever action is taken by the Committee will represent the practice of the great majority of companies. In order that it may do this, it is desirable that the companies communicate promptly with the Committee.

The Committee wishes, in other words, to get expressions of opinion, both for and against the adoption of new units, particularly where such expressions are based on actual experience.

(Data Sheet.)

Name of Company .....

City ..... State .....

Do you operate interurban or city service?
Do you operate a freight or express service?
What statistical unit are you using in connection with your freight and express service?
What statistical unit are you using in your passenger service?
Have the above units proved satisfactory?
If not, state reasons why?
Average number of motor cars operated daily.
Average number of trailer cars operated daily.
What units would you recommend for general adoption, and give reasons?

REPORT OF THE COMMITTEE TO DEVELOP UNIFORM DEFINITIONS FOR TERMS COMMONLY USED IN THE TRANSPORTATION DEPARTMENTS OF AMERICAN ELECTRIC RAILWAYS

Mr. M. C. Brush, chairman, reported that a meeting of the Committee had been held on Saturday, January 27th, at which were present, in addition to the chairman, W. C. Callaghan and I. H. McEwen, the remaining members of the Committee. Mr. Brush described the proposed plan of work as follows:

That each member of the Committee will submit a list of terms in common use in his particular section. These will be placed in the hands of Mr. Frederic Nicholas, Associate Editor of the *Electric Railway Journal*, by March 1st, soon after which time a meeting will be held and a circular letter sent to member companies, containing the terms and tentative definitions, with a

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request that the companies submit suggestions or approval. From the information thus gathered, a definite report will be made to the Convention which, it is hoped, the Transportation and Traffic Association will approve and recommend for use as Standard.

On motion, duly seconded and carried, the report was approved.

The suggestion was then made that the Committee be increased by the addition of one member who would consider terms in use on interurban lines and at the suggestion of Mr. Dana Stevens, Mr. A. Benham, Assistant General Manager of the Ohio Electric Railway Co., was recommended for appointment.

The Committee then took up with General George H. Harries, First Vice-President of the American Association, the matter of a recommendation made in the report of the Committee on Federal Relations, of which General Harries is chairman, to the 1911 Convention, that the American Association attempt to co-operate with the American Railway Association in the formulation of standard codes of rules. After a full discussion, General Harries agreed to take the matter up with Mr. Daniel Willard, President of the American Railway Association, with a view to arranging for a conference between representatives of that Association and the Transportation and Traffic Association, to which this matter has been referred by President Thomas N. McCarter, of the parent body.

The matter of submitting to the Chairmen of the Committees of the Transportation and Traffic Association, rules for the conduct of the work of the committees was discussed and, on motion duly seconded and carried, the Secretary was instructed to furnish each chairman with a code of procedure which will cover all matters relating to Committee work and outline in some detail the method of arranging reports for presentation to the Convention.

On motion, duly seconded and carried, the meeting then adjourned, subject to the call of the Chair.

Respectfully submitted,

H. C. DONECKER,

Secretary.

Approved:

J. N. SHANNAHAN,

President.

(On motion, duly seconded, the report was accepted.)

PRESIDENT SHANNAHAN:—The next order of business is the report of the Secretary-Treasurer.

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ANNUAL REPORT OF THE SECRETARY-TREASURER FOR THE YEAR ENDED SEPTEMBER 30, 1912

To the American Electric Railway Transportation and Traffic Association.

GENTLEMEN.— The Secretary begs herewith to report a brief statement, mostly concerning the matter of finances. Your President has covered in considerable detail the work of your various committees and it is therefore unnecessary for me to repeat anything at this time.

The expenses of the year have not differed greatly from those of 1911, though there have been some new committees formed and the work has considerably increased over that of the previous year.

Speaking somewhat personally and perhaps duplicating some of the expressions of Mr. Shannahan, I beg to call attention to the new Association publication, the AERA. No new movement that the Association has inaugurated in recent years has to my mind so closely welded the membership as this decision to issue a monthly publication. Of course, you must understand, however, that to maintain the standard established by the first issues to date, the membership must be loyal in its support of the AERA and the officials of the member companies and individual members as well must be consistent in supplying the material to fill the pages of the new book. It is not necessary to be a literary expert to do this. What the railroad man wants is a recital of facts that are interesting and valuable and that will cover some phases of the work which receives his daily attention. There is no question but that in the practice of many member companies there are ideas perhaps only known to the man who has put them into effect — "kinks" we might call some of them — but they are sufficiently valuable to merit recording in the publication which your membership supports and which it is hoped will prove of tangible value to the companies as a whole and to every department of each individual unit. The Question Box feature of the AERA is something that deserves your hearty support. It does not require much time for you to sit down and dictate answers to queries appearing therein, and certainly there must come up almost daily in your work little problems which would form the basis of a question which you could send to the Secretary's office and upon which you could obtain information inside of thirty days. The National Electric Light Association has developed this Question Box splendidly and it serves a useful purpose to some 15,000 members. The electric railway industry offers at least as wide a field and as the Secretary of your Association, I hope the members of the Transportation and Traffic Association will not lag behind in making this Question Box the success that it is destined to be with proper support.

I desire to call attention to the matter of inquiry forms. Perhaps because through having to handle most of those sent out, I realize

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the extent of their distribution fully as well as any of the members. It is needless to call attention to the usefulness of the information which is collected in this way. At the same time it has been realized that many companies, particularly the smaller ones, have found it a hardship to answer any considerable number of inquiries, and with more than fifty committees at work, it is quite likely that a comparatively large number of data sheets may be developed in a single year. Realizing this, the Association has this year put into effect a plan through which a single member company will receive but 20 per cent. of the total number of inquiries sent out in any one year. In other words, we have divided the companies into five sets, each one of which receives an inquiry in turn. This means that with a membership of 400 companies but 80 receive a given data sheet and these 80 companies will not receive another inquiry until the four other sections have each received a different data sheet. This plan will relieve you of answering 80 per cent. of the inquiries, but it will not be successful unless the 20 per cent. that you do receive, receive proper attention and the committee placed in the possession of data which is required to carry out the instructions of your Executive Committee. When you receive an inquiry, therefore, please think of this new plan, send along the information requested and do not leave it to somebody else to provide, as the somebody else will not receive that particular data sheet and we will be without information unless you see to it that the data is supplied.

Your President has called attention to the very general use to which the Standard Rules adopted by this Association have been put. Shortly after the Convention, it is the purpose of the Association to issue to each member a copy of each recommended standard that has been adopted by this Association. This will be sent you in loose leaf form with a proper loose leaf binder in which the same may be inserted. From year to year the new standards adopted will be sent to be added to this folder. It is hoped in this way to bring about greater use of the many excellent recommendations of your committees and afford you a means of determining just what has been concluded to be best practice without having to search through the books of the Association for the information. Standardization is the order of the day and nowhere can it be better applied than in the electric railway business. The Transportation and Traffic Association should not fall behind the other Associations in making use of Standards of Recommended Practice which the judgment of your committees suggests from time to time. Let us start the new year by making a study of just what has been developed by your Association, with the idea of putting it into effect on each of our systems or suggesting to the Association ways and means in which improvements may be made. Unless something of this kind is carried out, the co-operative influence of Association

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work is lost and Standards adopted but unused become purely ornamental and seemingly an indication of just how far in theory really practical men may go.

I should like to take this opportunity of thanking the officials of the member companies for the help extended this year in replying to communications from the Secretary's office. Many of these required answers in considerable detail and it has been most gratifying to note the cordial responses which the members have made.

Respectfully submitted,

H. C. DONECKER,
Secretary-Treasurer.

EXPENSES FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1912

Executive Committee	$538 73
Committee on Subjects	82 50
Committee on Interurban Rules	145 75
Committee on City Rules	40 64
Committee on Express and Freight Traffic	68 30
Committee on Passenger Traffic	162 94
Committee on Fares and Transfers	152 75
Committee to Develop Uniform Definitions	24 40
Committee on Construction of Schedules and Time-tables	387 25
Joint Committee on Express and Freight Accounting	34 50
Joint Committee on Block Signals for Electric Railway Operation	210 05
Committee on Train Operation	80 08
Proceedings	2,955 73
Total	$4,883 62

INDIVIDUAL MEMBERS ALLIED WITH THE TRANSPORTATION AND TRAFFIC ASSOCIATION

January 25th to September 30th, 1912.

Allen, W. C., Supervisor, Public Service Railway Co., Newark, N. J.

Arnold, A. Scott, General Passenger & Freight Agent, Maryland Electric Railways, Annapolis, Md.

Baldwin, Chas. A., Superintendent Transportation, Union Traction Co. of Indiana, Anderson, Ind.

Banghart, C. S., General Superintendent, New York & Queens County Railway Co., Long Island City, N. Y.

Baumann, Chas. A., Assistant Division Superintendent, Public Service Railway Co., Newark, N. J.

Bell, Chas. D., General Superintendent, Arkansas Valley Interurban Railway Co., Wichita, Kansas.

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Bell, Peter, Division Superintendent, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Blake, Geo. H., Trial Attorney, Public Service Railway Co., Newark, N. J.

Bogges, S. E., General Superintendent, People's Traction Co., Galesburg, Ill.

Branagan, C. T., Pilot, The Riverside & Fort Lee Ferry Co., Edgewater, N. J.

Brown, Geo. R., Receiver, Port Richmond & Bergen Point Ferry Co., Port Richmond, N. Y.

Brown, Wm., Clerk in Employment Department, Public Service Railway Co., Jersey City, N. J.

Buckman, Allan R., Assistant Real Estate Agent, Public Service Railway Co., Newark, N. J.

Budenbender, Wm. C., Chief Clerk Transportation Department, Public Service Railway Co., Jersey City, N. J.

Bunn, Wm. J., Pilot, Port Richmond & Bergen Point Ferry Co., Port Richmond, N. Y.

Burke, T. P., Supervisor, Public Service Railway Co., New Brunswick, N. J.

Cameron, Bruce, Superintendent, United Railways Company of St. Louis, St. Louis, Mo.

Carroll, Henry, Collector, Port Richmond & Bergen Point Ferry Co., Port Richmond, N. Y.

Carter, B. H., Inspector, The Denver City Tramway Co., Denver, Colo.

Choate, Jos. K., General Manager, Otsego & Herkimer R. R. Co., Cooperstown, N. Y.

Christiansen, Geo., Supervisor, Public Service Railway Co., Newark, N. J.

Clark, E. C., Superintendent, Northampton Street Railway Co., Northampton, Mass.

Coe, Clarence H., Chief Instructor, Public Service Railway Co., Newark, N. J.

Conlon, A. Newton, Clerk, Public Service Railway Co., Newark, N. J.

Conway, Herbert E., Time-table Clerk, Public Service Railway Co., Newark, N. J.

Counselman, L. W., Superintendent, Riverside Traction Co., Riverside, N. J.

Cox, J. H., Inspector, The Denver City Tramway Co., Denver, Colo.

Curtin, David, Roadmaster, Bay State Street Railway Co., Boston, Mass.

Davidson, H. W., Clerk, The Denver City Tramway Co., Denver, Colo.

Derfus, Geo., Collector, The Riverside & Fort Lee Ferry Co., Edgewater, N. J.

Diehl, P. H., District Manager, Railway & Audit Inspection Co., Chicago, Ill.

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Dingwall, M. S. W., Superintendent, Aroostook Valley Railroad Co., Presque Isle, Me.

Dumford, Geo., General Express and Freight Agent, Bay State Street Railway Co., Brockton, Mass.

Eastman, A., General Manager, Windsor, Essex & Lake Shore Railway, Kingsville, Ont.

Farrington, H. E., Superintendent, Bay State Street Railway Co., Lowell, Mass.

Faulkner, H. A., Passenger Agent, Bay State Street Railway Co., Boston, Mass.

Ford, Harry K., Engineer Real Estate Department, Public Service Railway Co., Newark, N. J.

Frick, H. C., President and General Manager, National Railway Training Association, Kansas City, Mo.

Furbay, Charles L., Traffic Manager, Sao Paulo Tramway, Lt. & Power Co., Sao Paulo, Brazil.

Gettings, J. J., Division Superintendent, Public Service Railway Co., Elizabeth, N. J.

Gorenflo, W. F., General Manager, Gulfport & Mississippi Traction Co., Gulfport, Miss.

Grooms, B. L., Superintendent Railway, Key West Electric Co., Key West, Fla.

Harris, H. L., Superintendent Railway Department, Texarkana Gas & Electric Co., Texarkana, Ark.

Hartley, Geo. L., Superintendent and Purchasing Agent, Grafton Traction Co., Grafton, W. Va.

Healy, John F., Instructor, Public Service Railway Co., Newark, N. J.

Hibbs, C. D., General Superintendent, United Railroads of San Francisco, San Francisco, Cal.

Hill, Minot J., General Manager, Philadelphia Street Railway Co., Bristol, Pa.

Kelsey, Edw. R., General Passenger Agent and Manager Publicity Department, Toledo Railways & Light, Toledo, O.

Kempster, A. L., Superintendent Transportation, Puget Sound Traction, Light & Power Co., Seattle, Wash.

Kershaw, Jos., Inspector, Public Service Railway Co., Newark, N. J.

Killa, A. J., Interurban Division Superintendent, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Kline, C., General Superintendent, Enid City Railway Co., Enid, Okla.

Kummerlein, Geo., Jr., Superintendent Transportation, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Kummerlein, Geo. L., Station Clerk, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Kummerlein, Walter, Division Superintendent, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Lake, Alfred S., Clerk, Public Service Railway Co., Newark, N. J.

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Larson, Carl O., Receiver and Timekeeper, The Riverside & Fort Lee Ferry Co., Edgewater, N. J.

Leahy, Chas. P., Car Timer, Public Service Railway Co., Newark, N. J.

Logan, M. R., Pilot, The Riverside & Fort Lee Ferry Co., Edgewater, N. J.

Luhr, Geo., Supervisor, Public Service Railway Co., Dunnellen, N. J.

MacFayden, John, Investigator, Public Service Railway Co., Newark, N. J.

McArthur, I. H., Superintendent, Meridian Railway & Light Co., Meridian, Miss.

McArthur, Robt. A., Supervisor, Public Service Railway Co., Newark, N. J.

McCabe, John J., Pilot, The Riverside & Fort Lee Ferry Co., Edgewater, N. J.

McClave, W. N., Superintendent of Inspection, Public Service Railway Co., Newark, N. J.

McCarthy, Paul O., Superintendent Transportation, Fort Smith Light & Traction Co., Fort Smith, Ark.

Mathes, L. D., General Manager and Purchasing Agent, Montgomery Light & Traction Co., Montgomery, Ala.

Mellen, Bernard F., Supervisor of Inspection, Public Service Railway Co., Newark, N. J.

Nicholas, Jas., Supervisor, Public Service Railway Co., Newark, N. J.

Orts, J. M., Assistant Chief Instructor, Public Service Railway Co., Newark, N. J.

Passailaigue, T. W., Jr., Assistant to Superintendent, Charleston Consolidated Railway & Lighting Co., Charleston, S. C.

Peirce, Wm. C., Supervisor, Public Service Railway Co., East Orange, N. J.

Pierner, Chris., Motor Instructor, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Pierson, P. W., Secretary to General Manager, Public Service Railway Co., Newark, N. J.

Port, Chas. S., Division Superintendent, The Denver City Tramway Co., Denver, Colo.

Potter, J. P., Assistant to General Manager, San Francisco-Oakland Terminal Railways, Oakland, Cal.

Preuster, Walter G., Car Timer, Public Service Railway Co., Newark, N. J.

Rice, Geo. L., Superintendent Southern Division, The Denver City Tramway Co., Denver, Colo.

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Riegle, C. R., Conductor Instructor, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Riordan, John F., Jr., Station Master, Public Service Railway Co., Harrison, N. J.

Scheife, Henry F., Division Superintendent, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Seip, W. H., Superintendent Central Division, The Denver City Tramway Co., Denver, Colo.

Sexton, Jos., Clerk Transportation Department, Public Service Railway Co., Newark, N. J.

Southard, Frank C., Supervisor, Public Service Railway Co., Newark, N. J.

Sparrow, Clarence, Station Master, Public Service Railway Co., Newark, N. J.

Sparrow, J. F., Supervisor, Public Service Railway Co., Newark, N. J.

Starkey, J. F. General Passenger Agent, Lake Shore Electric Railway Co., Sandusky, Ohio.

Sullivan, James W., Superintendent, Middlesex & Boston Street Railway Co., Auburndale, Mass.

Swift, Chas. A., Instructor, The Denver City Tramway Co., Denver, Colo.

Thornton, E. E., Superintendent, San Francisco-Oakland Terminal Railways, Oakland, Cal.

Titus, W. E. Superintendent, Elizabeth & Trenton R. R. Co., Trenton, N. J.

Tracey, Geo., Pilot, The Riverside & Fort Lee Ferry Co., Edgewater, N. J.

Tranier, M. N., Assistant Instructor, Public Service Railway Co., Hoboken, N. J.

Urban, H. L., Division Superintendent, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Valentine, H., Supervisor, Public Service Railway Co., East Orange, N. J.

Vorce, C. B., Construction Engineer, British Columbia Electric Railway Co., Ltd., Vancouver, B. C.

Wallace, A. E., Division Superintendent, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

Waller, O. A., Road Officer, The Denver City Tramway Co., Denver, Colo.

Walls B. H., Inspector, The Denver City Tramway Co., Denver, Colo.

Weyker, Andrew W., Supervisor, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

White, J. E., Division Superintendent, The Milwaukee Electric Railway & Light Co., Milwaukee, Wis.

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Wild, Jacob, Inspector, Public Service Railway Co., Irvington, N. J.
Wilson, T. W., 548 Franklin Street, Buffalo, N. Y.
Winters, Ferd L., Assistant Superintendent, New Orleans Railway & Light Co., New Orleans, La.
Wisdom, John, General Superintendent, Jackson Railway & Light Co., Jackson, Tenn.
Wright, Wm. H., Division General Foreman, Public Service Railway Co., Camden, N. J.
Total, 106.

(On motion, duly seconded, the report was approved.)

PRESIDENT SHANNAHAN:— Next in order is the appointment of a Committee on Resolutions. In what manner shall this be done?

On motion, duly seconded and carried, the President was directed to appoint this Committee and thereupon named Messrs. E. C. Faber, L. C. Bradley and E. F. Peck.

PRESIDENT SHANNAHAN:—I will now ask Mr. E. C. Faber to present the report of the Committee on Subjects.

MR. FABER:— Mr. President, the Secretary has included the report of the Committee on Subjects in the report of the Executive Committee.* Mr. President, I want to follow my report this year by suggesting that the Committee on Subjects be abolished. This work could be handled more advantageously by the Executive Committee and the President working directly with the chairman of the several standing committees, of which there are fourteen. The President of the Association is in closer touch with the work that is being carried on by the several standing committees, and I believe could take care of the work which has previously been looked after by the Committee on Subjects, with very little extra effort. I, therefore, should like to offer the following resolution, viz. That the Committee on Subjects be abolished and the work of this Committee be taken care of by the President of the Association.

(On motion, duly seconded and carried, the resolution was adopted.)

PRESIDENT SHANNAHAN:—The Committee on City Rules, Mr. E. F. Peck, Chairman, will now make its report.

*Included in Report of the Executive Committee, see p. 49.

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REPORT OF THE COMMITTEE ON CITY RULES

To the American Electric Railway Transportation and Traffic Association:

GENTLEMEN.— The Committee begs to submit its report as follows:

Shortly after the appointment of the Committee, your Executive Committee met and drafted instructions to govern this year's work of the Committee on City Rules as follows:

(a) That this Committee hold a joint meeting with the Committee on Interurban Rules and attempt to harmonize conflicting rules in the two codes.
(b) That the Committee be instructed to collect information on legislative and commission rulings with regard to rules for city operation.
(c) That the matter of rules for prepayment cars be further investigated.

Your Committee has attempted to carry out these instructions and during the year has held meetings and collected information of a nature that would enable it to develop such recommendations as would seem to be necessary to further perfect the present code.

One of the gratifying results of the year was the tenor of the replies received to a letter sent out by President McCarter to member companies, requesting information as to deficiencies in the codes and the extent of their application to actual service. This letter is already set forth in the report of the Committee on Interurban Rules, which Committee also remarks on the very general use to which the two codes have been applied by the companies throughout the country. As an appendix to the report of the Committee on Interurban Rules, some of the replies received from member companies in response to Mr. McCarter's letter referred to above, are shown.

During the period of the January Conference, your Committee held a meeting to which were invited representatives of the Committee on Interurban Rules to discuss rules in the two codes which while similar in meaning, were not uniform in wording. The result of this meeting was the appointment of a Subcommittee consisting of Messrs. W. B. Rockwell and J. J. Doyle to consider this particular matter, which Subcommittee, after due consideration, recommended as follows:

(1) That City Rule No. 23, Bell Signals. Signals from motorman to conductor, be amended to read as follows:

2 bells—"Pull trolley down to roof."
5 bells—"Watch trolley."
The other bell signals remaining as heretofore.

(2) That the third paragraph of City Rule No. 23 be changed to read as follows:

"The motorman will answer the signal to go ahead by two loud taps of the gong. If unable to proceed immediately upon receipt of signal, motorman will wait for another 'go ahead' signal before starting the car."
The balance of the rule to remain unchanged.

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(3) That Interurban Rule No. 183 be eliminated and City Rule No. 32 adopted in its stead.

We wish to call attention to the conflict which exists between City Rule No. 197 and Interurban Rule No. 377. This touches on such a broad question of policy that we hesitate to make any suggestion in the matter, but wish to draw the attention of both committees to the question in order that they may take such action as seems proper in the premises.

The recommendations of the Subcommittee were considered by both the Committee on Interurban Rules and this Committee, with the following results:

(1) That the amendments with regard to City Rule No. 23 be approved, with the exception that instead of eliminating that portion of the third paragraph reading, "The motorman will answer the signal to stop from conductor by one loud tap of gong," the paragraph be changed to require that the motorman give two taps of the gong as the answer signal to the conductor, whether the conductor's signal to the motorman is to stop or to go ahead.

This rule in its present form and as it is proposed to be revised is set forth in the report of the Committee on Interurban Rules to be presented here to-day.

(2) That the recommendation, that City Rule No. 32, Steam Railroad Crossings, be substituted for Interurban Rule No. 183, be approved with the exception that in Rule No. 183, interurban operation only, the requirement that motorman look back before starting, be eliminated.

Both rules are shown in the report of the Committee on Interurban Rules to be presented here to-day.

(3) The Committee on City Rules begs to heartily approve the recommendation of the Subcommittee that City Rule No. 197 and Interurban Rule No. 377 receive thorough discussion on the floor of this Convention.

It agrees that the question involved is one of policy and feels that the Convention, as a whole, should express itself for the guidance of the two committees if future amendments or reconciliation of the two rules are to be made. Both rules are shown in the report of the Committee on Interurban Rules to be presented here.

Your Committee has no further recommendations to make with regard to changes in the code proper but will discuss later in the report the section devoted to prepayment car operation.

LEGISLATIVE OR COMMISSION RULINGS

Inquiry concerning action taken by regulating bodies with regard to rules for city operation has not developed anything that would indicate that the rules for city operation have received anything but cursory attention at the hands of such bodies. The Committee is therefore unable to present anything of particular value on this

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subject at this time. It recommends, however, that another study be made during the next year and also that a similar letter to that sent out by Mr. McCarter in 1912 be sent to members in future years, feeling that in this way the use of the standard codes will be increased from year to year.

RULES FOR PREPAYMENT CAR OPERATION

Your Committee requested from companies utilizing prepayment operation, data with regard to rules which applied especially to that class of operation, with a view to comparing such rules with those adopted by this Association as standard practice. Subsequently a compilation was made, to determine what essential differences exist in rules covering the various points and what additional regulations, if any, were in general use beyond those covered in that section of our Standard Code, beginning with Rule No. 350 and ending with Rule No. 377. Taking up these rules in order we find the following variations:

Our Rule No. 350, Position, reads:

> The conductor's position under all ordinary circumstances is at the rear, in the place provided for him. While the car is at a standstill, taking on and discharging passengers, he must watch both the entrance and exit and see that passengers board and leave the car by the proper openings. The conductor should not leave his position at rear at places where several passengers are likely to board or leave the car.

Some of the variations from this rule provide as follows:

That conductor, when passengers are boarding car, "must stand facing directly to rear of car."

Conductor must stand "so that he obtains a full view of the fare box." This last specification is found in the rule books of a number of companies, as is also the provision that "the conductor must see that passengers are safely on or off car before giving the signal to proceed."

Another company specifies that "in descending steep grades conductor should be in a position to apply promptly the rear hand brake in case of necessity."

No replies have been received from companies using center entrance prepayment cars. It is obvious, however, that changes in the present Rule No. 350, would be required to make it apply to center entrance operation.

Our Rule No. 351, Fare Collection, reads:

> The conductor must register every fare promptly when collected. He shall not allow unauthorized passengers to pass into the car without paying fare. When passengers enter interior of car without paying fare, the conductor must enter car and collect fare as soon thereafter as his duties at the rear permit, returning at once to his position at the rear. Conductors shall request passengers to "have your fare ready, please."

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There are several features relating to fare collection incorporated in the rules of member companies, to some of which your Committee desires to call attention.

One company stipulates that "Fares must never be allowed to remain on top of fare box, but must be dropped promptly into box beneath. If fares are allowed to accumulate, conductor will be unable to tell what kind of fare passenger has paid. Conductors must not handle fares but must insist that passenger drop own fare in box.

Other companies provide in this rule for procedure in case of deposit in fare boxes of excess fares; also place upon the conductor the responsibility for counterfeit or mutilated coins.

Some companies incorporated in their Rules Covering Fare Collection, the provisions of our Rule No. 357, covering the collection of fares from passengers who ride to the end of the line and return on the same car. Our Rule No. 357 provides that conductor shall be careful to collect the fares from such passengers, but does not state in what manner this shall be done. Some companies require the passengers to go to the rear platform to deposit same in fare box.

Other companies provide for the registration of fares collected before change is made or transfers issued. They also provide in the same rule for the collection of transfers. Provision is also made for the registration of fares in the presence of the person paying fares for a party of more than one.

Our Rule No. 352, Making Change, reads:

> When a passenger presents a bill or coin which would cause delay in making change, and others are waiting to enter car, the conductor shall politely request passenger to step aside on the platform until he has opportunity to make change.

Some companies provide in this for the amount of change that conductors must carry and also describe the procedure to be followed when passengers present money for change, that is, that a conductor shall return to the passenger the full amount, the passenger then to deposit in fare box the proper fare.

Our Rule No. 353, No One to Remain on Rear Platform, reads:

> The conductor shall request passengers to enter the car and to move forward, endeavoring to keep exit and entrance portions of the platform clear at all times.

Many companies are much more explicit in the procedure to be followed to relieve the platform of passengers and also provide in this rule for the closing of doors or gates to prevent other passengers boarding the car, while other companies state that, under no circumstances, must ejectments be made for failure to obey the request of the conductor to enter car from platform.

Our Rule No. 354, Transfers, reads:

> Conductors will be governed by the existing regulations regarding the acceptance and issuance of transfers. If the validity of a transfer is in doubt, request the passenger to step aside until the matter can be decided in the usual way.

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Inspection of the rules of other companies on this subject indicate quite general similarity to our rule, except that many provide in this rule that transfers will only be issued at the time fare is paid and also cover the rules for depositing transfers where fare boxes are used.

Our Rule No. 355, Preventing Accidents, reads:

> The conductor shall see that all incoming passengers are safely on the platform before giving "Go ahead" bells, and that those leaving the car at rear end do not step off while car is in motion.

This rule, in many cases, is covered in the rule "Position of Conductors," and provision is also made for closing doors or gates where used. Also, provision is made in this rule to cover operation of doors by motormen, and some companies call particular attention to the fact that before giving starting signals, conductors must be careful to see that aged or infirm persons are in safe position within the car.

Our Rule No. 356, Leaving Car, reads:

> When conductor is obliged to leave car for any purpose except flagging or other regular duties, the motorman shall close front end of car, take conductor's position and proceed as required by Rule 29.

And Rule No. 29, referred to, reads:

> When necessary for conductor to leave his car he must notify the motorman to protect passengers and car. Should passengers board car during absence of conductor, motorman will notify conductor of the number and location of such passengers upon his return.
>
> Cars in commission must not be left unprotected; either motorman or conductor always remaining in charge.

The following differences in the rules of member companies are noted:

> "Where cars are provided with doors, conductors are required to close rear door and leave by front door when flagging railroad crossings."

Other companies provide that when conductors leave car, motormen will go to rear of car, permit passengers to enter and register fare properly in the presence of passengers.

Other companies prohibit passengers from boarding car in the absence of conductor.

Some companies specify that both men must not leave car at one time.

Our Rule No. 357, Passengers Riding to End of Line, reads:

> Conductors shall be careful to collect the fares from passengers riding to the end of the line and returning on same car.

The variations in the rules of member companies covering this matter have been referred to in the discussion under Rule No. 351.

Our Rule No. 358, Package on Platform, reads as follows:

> Bundles, packages, or anything else shall not be allowed to remain on rear platform.

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Generally speaking, the rules of the member companies follow this rule quite closely.

Our Rule No. 359, Comfort of Passengers, reads:

> The conductor's position at the rear must not interfere with the proper care of passengers as required by the General Code.

This rule is omitted by a number of companies and those who have it in use follow quite generally the present Rule No. 359.

Our Rule No. 375, Position of Motorman, reads:

> The motorman's position is on the front platform, except when he is relieving the conductor as provided in conductor's rule No. 356.

Some companies do not specify the position of motormen; other companies while specifying it, also include in the rule restrictions against passengers standing on front platform; other companies provide in this rule for the operation of the front door by the motorman, also that he is required to pay attention to alarms from push buttons.

Our Rule No. 376, Exit Door to be Kept Closed, reads:

> The exit door of front platform must not be opened while car is in motion and must be closed before car is started.

This seems to be a quite general rule.

Our Rule No. 377, Persons Not Allowed to Board at Front, reads:

> No person shall be permitted to board the car at front platform.

This is also quite general practice.

Some other rules for motormen provide for care in starting cars, that he shall be careful to see that the clothing of passengers alighting from car is free of doors, etc.; still other rules call attention to the duties required of motormen at terminals, and some companies specify the point at which cars shall be brought to a stop, that is, as regards relation to the cross walks.

In the various codes submitted to your Committee, a number of conditions are covered under prepayment operation which our present code has not taken note of. Many of these apply to conditions in connection with the use of fare boxes and some of the subjects treated are, procedure to be followed when improper fares (counterfeit or multilated coins) are deposited, the use of identification slips which conductors drop into fare boxes, rules covering entrance and exit passage ways, the use of the "Car Full" sign, regulations where doors are used and the use of push buttons.

Your Committee submits the above with the idea of having those members who are operating prepayment cars enter fully into the discussion of this section of the present code, as in the opinion of the Committee it is at present incomplete and in need of considerable elaboration. Your Committee feels, however, that it is inadvisable to attempt to suggest changes and additions without further information

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from the members and expressions as to the satisfaction derived from rules and regulations already in effect. It therefore recommends that the subject be continued another year and closes its report with the hope that the members present will by full and free discussion of these prepayment rules provide information that will enable the 1914 Committee to make some headway in the development of a set of rules that will adequately cover all phases of prepayment operation.

Respectfully submitted,

E. F. PECK, *Chairman,*
J. MCMILLAN,
GEO. KUEMMERLEIN, JR.,
W. A. HEINDLE,
W. H. GLENN,
W. B. ROCKWELL,
Committee on City Rules.

Discussion of the Report of the Committee on City Rules

PRESIDENT SHANNAHAN:—You have heard the report of the Committee, gentlemen, is there any discussion? Is there any criticism of the work of this Committee? It has made one suggestion which requires the approval of this Association in Convention, namely as to whether you will adopt City Rule No. 32 for Interurban Rule No. 183. I should like to ask Mr. Allen to present his views as to whether it is practicable to place either of these in both codes.

MR. ALLEN:— Mr. President, in order that an expression may be had, I would move you that it be the sense of this meeting that Rule No. 32 of the Code of City Rules be adopted as a part of the Code of Interurban Rules and that we try to convince the Committee on Interurban Rules that it be substituted for their Rule No. 183. I make this motion simply to get an expression of opinion from those in attendance here.

MR. W. H. COLLINS:— Speaking for myself, Mr. President, I am in favor of the motion recommending the adoption of Rule No. 32, City Code, in place of No. 183, Interurban Code. I think it is more direct and clear and covers the situation much better than does Rule No. 183.

MR. EMMONS:—I think the reason Rule No. 183 has stood in the Interurban Rule book as it has is because of the State Law of Indiana and, because of that law it is necessary for the Indiana roads to retain Rule No. 183 as it now stands.

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I was quite surprised to hear that the commission of Indiana had approved these changes. We have not been so advised.

PRESIDENT SHANNAHAN:—I can say that our information is from Mr. Alexander Shane, he having advised the Secretary of this Association that the Indiana commission had taken such action.

MR. EMMONS:—Has an order been issued by the Indiana Railroad Commission at this time?

PRESIDENT SHANNAHAN:—No.

MR. EMMONS:—While there are some differences, Mr. Chairman, I do not see that they are so far apart. One objection to the Rule No. 183 lies in the fact that the language is a little obscure. A train ten miles away would be "approaching," but we felt that a man could use his judgment as to whether it was "about to cross," so the rule was retained, reading exactly as the law does. The elimination of the requirement that the motorman look back to the rear, is not a good one, I think, because there are a great number of Interurban cars where it is perfectly possible for the motorman to glance back to the rear to see if some passenger is getting on or off. Where it is possible I think that part of the rule at least should be retained.

MR. J. W. BROWN:—Rule No. 32 states that motorman shall satisfy "himself that steam cars are not approaching," while Rule No. 183 states, "* * * No train approaching and about to pass over the crossing." In city operation a car would not be expected to cross if a train were approaching, but in interurban operation a train on a prairie ten miles away might be visible. It would seem as though Rule No. 32 would forbid the car crossing because the train was approaching. It would appear that Rule No. 183 covers the situation better for interurban operation than Rule No. 32.

MR. CHERRY:—In Rule No. 183 (Interurban Code) the motorman simply receives the proper signal from the conductor. That does not mean, necessarily, that he is going to go out to the crossing, as I understand it, whereas by Rule No. 32, the conductor is required to cross the tracks in advance of his car. I am in favor of Rule No. 32 being substituted in place of No. 183.

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PRESIDENT SHANNAHAN:—It strikes the Chair that this house may be composed to a large extent of city men, although I do not know that it is. City men may vote to adopt Rule No. 32 for both Codes, yet in spite of that fact the interurban companies may not follow the recommendation of the Committee.

Would it meet with the approval of the Association if the interurban men voted separately for or against this motion and later the city men? It surely would serve no useful purpose for this Association to seek to force on the interurban companies something which they will not adopt. What we want to do is to take such action as will meet with the approval and approbation of the interurban companies. The city companies already have this rule.

MR. W. H. COLLINS:— I have heard of no objections from interurban men, except Mr. Emmons, and that was based largely upon the question of the position taken by the Indiana commission. The other point he raised was that with reference to instructing the motormen to look back. I fail to see where that properly has any place in the rule at all. The motormen are always instructed to look back if possible before starting.

MR. BOYCE:—I would amend Rule No. 32 of the City Rule Book, provided that this rule is adapted for both city and interurban rule books, by incorporating in it the paragraph which reads as follows and is taken from the Interurban Rule No. 183:

"The Conductor shall be responsible for the motorman having in the front vestibule for immediate use in case of necessity, a red flag by day and a red light by night."

I move this as an amendment to Mr. Allen's motion.

(Amendment accepted by Mr. Allen.)

MR. MATTHEWS:—I would like to know whether the recommendation of the Committee on Interurban Rules is the recommendation of the Interurban roads, or whether that Committee was appointed to find out if this rule conforms to their wishes.

PRESIDENT SHANNAHAN:—Answering your question, the respective Committees were appointed to represent the respective roads, both interurban and city, and these Committees appointed subcommittees to confer on this point. Both Com-

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mittees have approved the recommendations of the subcommittees. It is fair to assume that the recommendations of the Committee on Interurban Rules represents Interurban roads.

MR. MATTHEWS:—Then I only see from reading these rules one difference between the two, and that is the question of the conductor flagging the crossings. The signal light and flagging question might properly stand in the Interurban rules, but the motion that the rule be made uniform in conformance with the recommendation of the Committee is a proper motion.

PRESIDENT SHANNAHAN:—The question is on Mr. Allen's motion. Calling for the adoption of City Rule No. 32, in lieu of Interurban Rule No. 183.

(The motion was carried by standing vote.)

PRESIDENT SHANNAHAN:—The Chairman states that the Committee definitely recommends only that which appears on pages 72 and 73 of the report. The balance of the report treats of rules for prepayment car operation and is simply presented for the consideration of the Association. Now, what is your pleasure on the definite recommendations of the Committee?

MR. ALLEN:— In order that there may be a formal motion for the acceptance and adoption of this Committee's report, I would move you that the resolution which was adopted on October 7, 1909, October 12, 1910, and October 11, 1911, which is placed in the front page of the Standard Code of Rules, be re-adopted at this Convention and at this time.

PRESIDENT SHANNAHAN:—Your motion includes only the adoption of the recommendations in this report?

MR. ALLEN:—Yes.

(Motion duly seconded and carried.)

PRESIDENT SHANNAHAN:— Now, the question comes on the rules for the operation of pre-payment cars.

MR. BRUSH:—I move that Rule No. 377 read as follows: "All pay passengers shall board the car at the end at which conductor is stationed, except at pre-payment terminals."

MR. EMMONS:— I rather think we are entering upon quite a difficult task, to make a set of rules in this Convention when the Committee, consisting of six persons, have been unable to come to a definite conclusion, as it says at the end of the report: "Your Committee feels, however, that it is inadvisable to

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attempt to suggest changes and additions without further information from the members and expressions as to the satisfaction derived from rules and regulations already in effect. It, therefore, recommends that the subject be continued another year and closes its report with the hope that the members present will by full and free discussion of these pre-payment rules provide information that will enable the 1913 Committee to make some headway in the development of a set of rules that will adequately cover all phases of pre-payment operation." I feel that this is a thing we have to do. I think we will simply have to refer all pre-payment rules back to the new rules committee, and try and get it to unite and put something up to the body assembled to pass upon, rather than attempt to formulate rules when we are in Convention assembled. I, therefore, make a motion that these pre-payment rules be referred back to the 1913 Committee with instructions that it endeavor to report a set of rules as a definite recommendation, so that they may be acted upon by the 1913 Convention.

(Motion duly seconded.)

MR. BRUSH:—Would it not be of value to the Committee considering these rules to have the opinion of the members of the Association who are here? If Mr. Emmons is willing to withdraw his motion I would like to take these rules up one at a time for discussion in order that the Committee in considering the matter during the ensuing year will have the benefit of the criticisms as made by the Association at this time. You will notice that on page 74 it says: "Taking up these rules in order, we find the following variations." Apparently your Committee has simply called attention to the fact that there are variations in the pre-payment rules, and I think the Committee should have the benefit of discussion by the Convention without the Convention making definite recommendation as to what rules should or should not be adopted.

MR. EMMONS:— It is perfectly satisfactory to go ahead with the discussion, but I do not believe we should attempt to definitely fix rules.

PRESIDENT SHANNAHAN:—That seems not to be Mr. Brush's idea — it is merely to give the Committee the benefit of the discussion.

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MR. EMMONS:— I withdraw the motion at this time, but I think a similar motion will have to be made at the conclusion of the discussion.

MR. BRUSH:— I now move that the variations in the prepayment rules as mentioned by the Committee be taken up one at a time and discussed by the Convention.

(Motion duly seconded and carried.)

PRESIDENT SHANNAHAN:—The first rule on which there is a difference is Rule No. 350. Now, is it the sentiment of this Association that the Committee's recommendation or suggestion receive any action?

MR. J. W. BROWN:—The rule reads: "The conductor's position under all ordinary circumstances is at the rear in the place provided for him." In view of the rapidly changing position of the conductor on new types of cars, would it not be better to have it read: "The conductor's position under all ordinary circumstances is at the ————." Covering center-entrance, front platform or rear platform, as the case may be. Again in the last clause: "position at rear," could be changed to "position in the ————."

MR. WOOD:—This might be covered by saying that "the conductor's position, except in extraordinary cases, should be at the point specified for fare collection," leaving that wherever it may be, center, front or rear.

MR. HEGARTY:—Mr. Chairman, in some cities, for example, the city of Birmingham, the colored passengers are loaded through the front end and the white through the rear.

MR. MCCARTHY:—We have a city ordinance governing the loading of passengers, which requires all white passengers to load by the front platform and all colored passengers by the rear.

MR. SULLIVAN:—In Chicago we have a rule that uniformed employees, policemen and mail carriers be allowed to board at the front end. We find this helps to fill up the front end, and leaves the rear less crowded.

MR. BRUSH:— On our property we permit employees to board by the front platform and further than that at terminals we permit passengers to board at either end.

PRESIDENT SHANNAHAN:— For the information of the Committee do you want to take a vote on this question, not as to

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the adoption of this, but as to the sense of this meeting? If not we will pass it and leave it to the Committee to make definite recommendations.

MR. ROCKWELL:— Mr. President, you notice that in our report we have cited four cases with reference to the conflict, and any rule that is made will have to operate as to the whole four.

PRESIDENT SHANNAHAN:—I would like to ask the Chairman of this Committee if it is the view of the Committee that a rule can be framed, one that can be made a standard rule?

MR. PECK:—The members of the Committee were of the opinion at the time we discussed this matter that it was an impossibility to reconcile a set of rules to different types of cars unless each type of car was considered separately..

MR. FRANKLIN:—I have always contended from the time the question was first taken up relative to a standard book of rules for city service, that you were entering upon an endless task. I do not think it possible to go into the details of operation in the different cities where local conditions govern, and we all know that they do govern. We can go a certain distance; standardize regarding the ringing of the gong by the motorman, the number of bells from the motorman to the conductor, the number of bells to stop and the number of bells to go ahead, and so forth, but I think it is impossible to go further.

MR. HEGARTY:—In this Rule No. 350 with reference to the position of the conductor, I suggest that it is a fair rule with the exception of the words "is at the rear," which will not cover center-entrance operation.

MR. ROCKWELL:—It says "under all ordinary circumstances." The center-entrance is an extraordinary circumstance.

PRESIDENT SHANNAHAN:—Mr. Hegarty, do you agree with Mr. Franklin or not? Do you believe that a rule can be formulated that will govern all types of cars?

MR. HEGARTY:— So far as the position of the conductor is concerned, I think it can, if the words that I have suggested be taken out are eliminated.

PRESIDENT SHANNAHAN:—Rule No. 351, is there any discussion?

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MR. BRUSH:— Mr. President, you could not possibly use that with the so-called International Fare boxes, which have a register connected directly with the counting mechanism, which does not make necessary the registering of the fare by the conductor.

MR. HEGARTY:—In Rule No. 351 appears the same wording as in No. 350, that is, with regard to the conductor's position being at the rear. If you leave out the three words "at the rear" it will be all right.

PRESIDENT SHANNAHAN:—Is there any further discussion of 351? Any discussion of the points raised by the Committee? If it be possible for this Committee to formulate any code of rules for pre-payment cars it will be only done by the help of you gentlemen. If they are to come here later with any code for adoption, it will be only because you have made it possible by freely discussing these points.

Rule No. 352. Is there any criticism or suggestion of the rule stated? (No response.) Rule No. 353?

MR. BADGERO:— I want to say that if Rule No. 353 is to be made to apply to center-entrance cars, I don't believe that it should have the word "platform." I do not consider the center of the car the platform. I think this should read "endeavoring to keep exit and entrance portions of the car clear at all times."

PRESIDENT SHANNAHAN:— Rule No. 354 on Transfers? (No response.) Rule No. 355?

MR. BRUSH:—In Rule No. 355, with the words "on the platform" after "shall see that all incoming passengers are safely," you meet the criticism of the center-entrance car.

MR. WELLS:—With reference to that particular section of Rule No. 355, which says that "The conductor shall see that all incoming passengers are safely on the platform before giving 'go ahead' bells, and that those leaving the car at the rear end do not step off while car is in motion," I do not believe this rule is specific enough. It seems to me there is a legal feature which has been overlooked. In my opinion it should be specified what precaution the conductor should take to prevent people from stepping off the rear platform or the step or the entrance, wherever they may be. Whether conductor

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should forcibly detain passengers, especially women and infirm persons, who attempt to leave a moving car, or whether a simple warning is sufficient should be thoroughly discussed and some standard arrived at. Perhaps it would be well to make some recommendation concerning this.

MR. LAMB:—In our city in Iowa, we found in an accident case that came up, where a woman was about to step off a car while it was in motion, the conductor called to her "don't step off until this car stops." This admonition saved us the payment of damages as the case was thrown out of Court. I would think the rule should have this wording, "do not step off while car is in motion," and if a passenger seems about to step off, call to them — do not step off this car until it stops.

MR. HEGARTY:—I think this is covered in Rule No. 21 of the City Code, reading:

"Conductor must not put his hand on bell cord until passengers have boarded or left car; bell cord must not be touched until it is time to signal motorman to go ahead," and there is also another clause that I have not yet found.

PRESIDENT SHANNAHAN:—Then does the Chair understand that your point is that this rule might properly be eliminated?

MR. HEGARTY:—I think the City Rule covers the point about discharging passengers more fully than this rule. The other rule I referred to is Rule No. 41. "While persons assuming positions of danger, such as boarding or leaving moving cars, walking behind a moving car when another car is approaching, etc., do so at their own risk, motormen and conductors should call the attention of such persons to the danger of so doing. Conductors on moving cars must give the danger signal (three bells) if an accident appears imminent."

PRESIDENT SHANNAHAN:—Is there any further discussion of this rule? (No response.) What is the opinion of this meeting regarding Rule No. 356? (No response.) Rule No. 357? (No response.) Rule No. 358? (No response.)

MR. MATTHEWS:—I would like to know the practice of other companies in collecting fares on prepayment cars when part of the load fails to alight at the end of a line, and other passengers are waiting there to board the car. What is the best way to collect fares in this case with the least confusion?

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MR. BRUSH :— Our custom is we keep the rear doors closed, open the front door and the passengers who desire leave by the front door. The conductor then starts at the front of his car and goes through and collects fares before he permits any passengers to board from the rear.

PRESIDENT SHANNAHAN :—Rule No. 359? (No response.) Rule No. 375? (No response.) Rule No. 376? (No response.) Rule No. 377.

MR. J. W. BROWN :— Mr. President, the discrepancy there might be covered by making it read " no pay passengers shall be permitted to board the car except at the entrance in charge of the conductor." That would cover center-entrance cars.

MR. BRUSH :— Mr. President, in order to make that really applicable it would be necessary to add the other exception, " except at pre-payment stations," so if it were changed slightly, saying " all pay passengers shall enter the car at the prescribed location of the conductor except at pre-payment terminals," all the points would be covered, I think.

PRESIDENT SHANNAHAN :— Is there any criticism of Mr. Brush's suggestion? Is there, in the opinion of any of you gentlemen, other rules that should have been incorporated that have been left out or not mentioned?

MR. MATTHEWS :—I would suggest that the rule be made that " all persons shall be required to enter the car at the rear end except motorman relieving the motorman on duty."

MR. CALLAGHAN :— May I ask why in Rule No. 376 provision is made for exit doors on the front platform only and a rule of the same kind for the rear doors is not included?

PRESIDENT SHANNAHAN :—Inasmuch as the purpose of this discussion is to enable the Committee to formulate a rule, won't you suggest one, Mr. Callaghan?

MR. CALLAGHAN :—I meant it that way.

PRESIDENT SHANNAHAN :— Is there any criticism of the two suggestions for Rule No. 377?

MR. MATTHEWS :— To make my suggestion plain, Mr. Chairman, I would suggest the rule be made that eliminates anyone boarding the front end of the car except the motorman relieving the man on duty.

MR. BRUSH :— It is absolutely foolish for us to recommend

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to companies the adoption of a rule which they will not accept. Rather it should seem to be our duty to frame a rule which would be applicable to all local conditions. I know on our own cars we permit mail carriers, policemen, etc., to enter in this way. For that reason I suggest the term "pay passengers."

MR. MATTHEWS:—Why not substitute the word "passengers" there?

MR. HEGARTY:—We have linemen who ride on the front platform, who board at the front end, and have their equipment with them, their tools hanging at their sides. We could not very well let them go through the car where the passengers are, also it applies to the uniformed officials of the city, like policemen. Why not substitute the word "passengers?"

MR. BRUSH:—Doesn't this suggested rule, Mr. President, cover Mr. Hegarty's criticism: "All pay passengers shall enter the car at the prescribed location of the conductor except at pre-payment terminals?"

PRESIDENT SHANNAHAN:—Does that not cover your objection?

MR. HEGARTY:—Yes.

MR. STEVENS:—That does not cover lines on which two fares are collected. Some of us have prepayment cars on lines of this kind and I would like the Committee to consider this matter.

MR. STANLEY:—The way we handle that is to give a suburban check when the passengers pay the five cent fare, the same as a transfer, and then after the car passes the city line the conductor goes in and collects the suburban check.

PRESIDENT SHANNAHAN:—What would your suggestion be, Mr. Stevens?

MR. STEVENS:—One method of operation may apply to other localities. When we get to the end of our city passage the conductor goes to the front and starts to collect. Fortunately our fare division is out in the country where there are but few people getting on and off.

PRESIDENT SHANNAHAN:—And that is still true with the pre-payment car.

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MR. STEVENS:—Yes. That is operating through two cities.

PRESIDENT SHANNAHAN:—Is there any further suggestion in connection with this Rule No. 377? (No response.)

I will entertain Mr. Emmons' motion now.

MR. EMMONS:—I move that the question of prepayment rule be referred back to the Committee on City Rules with instructions that it endeavor to make a definite report for prepayment rules to the 1913 Convention. I think, Mr. Chairman, it would be well if at least three of the members of the Committee were men operating prepayment cars so that we would have the benefit of their full experience.

(Motion duly seconded and carried.)

PRESIDENT SHANNAHAN:—The next business before this meeting is the report of the Committee on Interurban Rules. Mr. Collins will present the report.

REPORT OF THE COMMITTEE ON INTERURBAN RULES

To the American Electric Railway Transportation and Traffic Association:

GENTLEMEN.—The Committee on Interurban Rules begs to report that it has attempted to carry out the instructions of your Executive Committee, as listed below, and submits herewith a report of the conclusions reached.

INSTRUCTIONS FROM EXECUTIVE COMMITTEE

The following items were submitted to the Committee on Interurban Rules by the Executive Committee for development during the current year:

(a) That the Committee be instructed to hold a joint meeting with the Committee on City Rules and attempt to harmonize conflicting rules in the two codes. This meeting to be held, if possible, just prior to the mid-year meeting of the Executive Committee.

(d) That the Committee be instructed to collect information on legislative and commission rulings with regard to rules for interurban operation.

(c) That the Committee be instructed to confer with a committee of the American Railway Association and attempt to reach some agreement as to the standardization of rules which affect both steam and interurban operation.

(d) That the Committee be instructed to make a study of and formulate a set of rules for block signal operation.

The Executive Committee in addition requested President Thomas N. McCarter, of the American Association, to forward a letter to

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member companies requesting suggestions as to inadequacies in the present codes of City and Interurban Rules, with a view to making such codes more nearly fit the requirements of a majority of the companies. This letter was sent out under date of January 23, 1912, and read as follows:

To the Officials of the Member Companies:

GENTLEMEN.— I am having sent you, under separate cover, copies of the standard code of rules for city and interurban operation adopted by our affiliated Transportation and Traffic Association and approved by the American Electric Railway Association.

The desirability of standard operating rules is obvious, and it is the object of this Association to so perfect its codes that they may be generally adopted by the members. To the end that we may know what progress is being made in this direction, we would ask that you indicate whether either or both of the codes have been put into use on the lines of your company, or if such action is contemplated. If not, a statement of your objections to the code is desired.

An expression from member companies as to defects or inadequacies, if any, will be of much assistance in the ultimate development of codes that will adapt themselves to the needs of the industry at large.

Your prompt attention will be appreciated.

Very truly yours,

THOS. N. McCARTER,

January 23, 1912. *President.*

It is very satisfactory to report that in the main the replies received from our members indicated a quite general adoption of the codes, either as a whole or in part. In the latter case, the changes, amendments or eliminations have been to suit some particular local condition. From this correspondence it would seem, as a whole, that the codes quite closely fit the demands of our members and, as a matter of general interest, we are attaching to the report, as an appendix, some expressions from the members received in response to Mr. McCarter's letter.

Your Committee has during the present year held two meetings, one being called during the period of the Mid-year Conference. Owing to serious illness in his family, the Chairman, Mr. C. F. Handshy, was unable to be present at this meeting and the Committee held a more or less informal session and also discussed with the Committee on City Rules the matter of the instruction that the two Committees endeavor to harmonize conflicting rules. A Subcommittee was appointed to study the two codes with a view to bringing about proper uniformity. This Subcommittee met subsequently and reported its findings at the second meeting of the Committee held in Chicago on July 20. The report of the Subcommittee follows:

> At a joint meeting of the City and Interurban Rules Committees in New York, January 26th, this Subcommittee was appointed and instructed to attempt, if possible, the elimination of conflicting rules of the two codes. In accordance therewith, the members met in Baltimore on May 7th and after studying the situation thoroughly, desire to suggest the following:

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(1) That City Rule No. 23, Bell signals. Signals from motorman to conductor, be amended to read as follows:
2 bells—"Pull trolley down to roof."
5 bells—"Watch trolley."
The other bell signals remaining as heretofore.

(2) That the third paragraph of City Rule No. 23 be changed to read as follows:
"The motorman will answer the signal to go ahead by two loud taps of the gong. If unable to proceed immediately upon receipt of signal, motorman will wait for another 'go ahead' signal before starting the car."
The balance of the rule to remain unchanged.

(3) That Interurban Rule No. 183 be eliminated and City Rule No. 32 adopted in its stead.

We wish to call attention to the confliction which exists between City Rule No. 197 and Interurban Rule No. 377. This touches on such a broad question of policy that we hesitate to make any suggestion in the matter, but wish to draw the attention of both committees to the question in order that they may take such action as seems proper in the premises.

All of which is respectfully submitted.

(Signed) W. B. ROCKWELL,
J. J. DOYLE,
Subcommittee.

May 10, 1912.

Your Committee at a meeting held in Chicago on July 20, 1912, discussed these suggestions in considerable detail and disposed of them as follows:

Recommended, that City Rule No. 23, "Bell Signals," be changed to conform to recommendations of the Subcommittee and thus become uniform with Interurban Rule No. 98: The Committee did not approve the change in the third paragraph of City Rule No. 23, which eliminates the following: "The motorman will answer the signal to stop from conductor by one loud tap of gong," but recommended that this paragraph be changed to require that motorman give two taps of the gong as the answer signal to the conductor, whether the conductor's signal to the motorman is to stop or go ahead. Rule as revised reads as follows (the amended section bracketed in italics):

BELL SIGNALS.

23. From conductor to motorman to be given on motorman's signal bell:
1 bell—"Stop at next crossing or station."
2 bells—"Go ahead."
3 bells—"Stop immediately."
4 bells (given when car is standing)—"Back car slowly."

From motorman to conductor, to be given on conductor's signal bell:
1 bell—"Come forward."
2 bells—"Watch the trolley" and danger signal to the conductor.

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[*2 bells—"Pull trolley down to roof."*]
3 bells—"Set rear brake."
4 bells—Signal to conductor that motorman desires to back the car.
[*5 bells—"Watch trolley."*]

Whenever a car in service is stopped, for any cause except to take on or let off passengers, the motorman will, as soon as he is ready to go forward, give two taps of the gong; after which, if the conductor is ready to proceed, he will give the "Go ahead" signal.

The motorman will answer the signal to stop from conductor by one [*two*] loud taps of the gong and 2 loud taps of the gong after receiving the signal to go ahead. If unable to proceed immediately upon receipt of signal, motorman will wait for another "Go ahead" signal before starting the car.

When car is standing and motorman desires to back for any reason, he will give the conductor four bells, but must not move the car until the conductor has answered with four bells to signify "All is clear behind." However, when it is necessary to back for any distance, or whenever any danger would be likely to result from backing, motorman must always change ends on a double end car.

When two or more cars are coupled together, "Go ahead" signal must first be given by conductor of rear car and be repeated by each conductor in succession on his signal bell, when he is ready to start.

The Committee further approved the recommendation of the Subcommittee that City Rule No. 32, "Steam Railroad Crossings," be substituted for Interurban Rule No. 183, with the exception that in Rule No. 183, for interurban operation only the requirement that motorman look back before starting car be eliminated as impracticable. For purposes of comparison both rules are shown herewith.

STEAM RAILROAD CROSSINGS (City Rule).

32. When approaching steam railroad or other flag crossings, the motorman will bring his car to a full stop at a distance of ..... feet, and will not proceed until the conductor has gone ahead to the center of the crossing, looked both ways, and give the COME AHEAD signal. Before starting, the motorman will look back to see that no passengers are getting on or off; and in no case proceed, even after the conductor's signal, until he has also examined the crossing and satisfied himself that steam cars are not approaching.

When there is more than one track the conductor must remain in advance of the car until the last track is reached.

After boarding car, conductor will give GO AHEAD signal to notify motorman that he is aboard. Motorman is forbidden to proceed without this signal.

Where crossing is protected by derail, interlocking plant, or flagman (employed by the company) this rule does not apply, special instructions being issued to govern in such cases.

CROSSING OTHER RAILROADS AT GRADE (Interurban Rule).

183. Every train must be brought to a full stop before crossing the tracks of any railroad at grade, at a distance of not less than

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fifty (50) feet from the railroad track, except when such crossing is provided with interlocking apparatus or other system of signals, and must not proceed until proper signal is received from the conductor, and crossing is seen to be clear, and no train approaching and about to pass over the crossing. The conductor shall be responsible for the motorman having in front vestibule, for immediate use in case of necessity, a red flag by day and a red light by night. This order strictly prohibits the motorman from taking a signal or order from any one else but his own conductor and conductors must not permit any one else to perform their duties at these crossings unless authority has been conferred upon another employee by the .....

Your attention is directed to the recommendation of the Subcommittee, that City Rule No. 197 and Interurban Rule No. 377 be discussed on the floor of the Convention. This Committee approves the suggestion and respectfully urges the Convention that this subject of Defective Transfers receive discussion here.

REFUSAL TO PAY FARE — TRANSFERS (City Rule).

197. When a passenger refuses to pay fare or presents defective bill, coin, transfer or ticket, upon which, in the judgment of the conductor, the passenger is not entitled to ride, the conductor must retain or make careful note of such defective transfer or ticket, and secure the names of as many witnesses to the fact as possible, whereupon the car must be stopped and the passenger requested to leave.

Eject if necessary and report as required by Rule No. 53.

If the conductor is in doubt as to whether or not the passenger has paid fare, or whether the fare (coin, ticket or transfer) tendered is good, then the passenger must be allowed to ride and the facts of the case brought to the attention of the first inspector, starter or official who is met, and the conductor must act according to instructions received from such inspector, starter or official. A note must be made of the incident on the back of the trip report.

When a passenger who refuses to pay fare requests to be allowed to leave the car, the car must be stopped and the person permitted to alight.

DEFECTIVE TRANSFERS (Interurban Rule).

377. Whenever a passenger presents a defective transfer, conductors will notify the passenger that transfer is not good, explaining why. If the passenger refuses to pay fare, lift the transfer, enclose it in an envelope, giving time, place, name of passenger, and all facts relating to the incident, and deliver the report to the Superintendent as soon as possible. Do not in case of doubt eject a passenger on a defective transfer.

The Committee also had in hand suggestions from various sources as to modifications in the Interurban Code and due attention being given to these, the following amendments to the code are respectfully suggested for the attention of the Convention:

That Rule No. 92 (c) now reading: "Swung vertically in a circle across the track when the train is standing," be revised to read

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"Swung vertically in a circle at half-arm's length across the track when the train is standing." [Diagram shown on Code page 100.]

That in Rule No. 92 (e), the words "in a circle" be eliminated and rule made to read: "Swung horizontally above the head when the train is standing." [Diagram shown on Code page 102.]

As follows (recommended changes shown, bracketed in italics):

HAND, FLAG AND LAMP SIGNALS.

Manner of Using.	Indication.
(a) Swung across the track.....	Stop.
(b) Raised and lowered vertically.....	Proceed.
(c) Swung vertically in a circle across the track when the train is standing.....	Back.
[(c) Swung vertically in a circle *at half arm's* length across the track when the train is standing.]	[Back.]
(d) Swung vertically in a circle at arm's length across the track when the train is running	Train has parted.
(e) Swung horizontally in a circle when the train is standing.....	Apply air brakes.
[(e) Swung horizontally above the head when the train is standing].....	[Apply air brakes.]
(f) Held at arm's length above the head when train is standing.....	Release air brakes.

That Rule No. 149, be changed to provide that one torpedo be placed on rail on engineer's side, that is, right-hand rail facing the crossing to be protected. The present rule requires two torpedoes, one on each rail immediately opposite each other.

As follows (recommended changes shown bracketed in italics):

ACCIDENT ON RAILROAD CROSSING.

149. In case of a breakdown or an accident which disables a train on a railroad crossing, not protected by interlocker, the conductor and the motorman must both attend to protecting their train, by one going in each direction at least three-quarters of a mile on the steam road tracks and placing two torpedoes, one on each rail immediately opposite each other. [*and placing one torpedo on rail on engineer's side, that is the right hand rail facing the crossing that is to be protected.*] Any responsible employee or other person may take the place of the motorman in flagging, in order that he may attend to getting his car off the crossing. When car is clear of crossing the flagmen may be recalled by whistle signal as provided in Rule 95, but the flagmen must remain at their posts and signal any approaching train to stop until recalled by whistle signal, using a red flag by day and red fusee by night, in addition to their lanterns. It is the duty of the conductor to first notify his passengers to leave the car.

That in Rule No. 159, second paragraph, the words "and motorman" be inserted after "conductor" in second line, and thus require both conductor and motorman to sign train register instead of conductor only.

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As follows (recommended change shown bracketed in italics):

TRAINS LEAVING INITIAL STATIONS.

159. A train must not leave its initial station on any division, or a junction, or pass from double to single track, without order or clearance, and until it is ascertained from the dispatcher whether all trains due have arrived and departed.

Where a train register is maintained, it shall be the duty of the conductor [*and motorman*] to register and to note carefully whether all trains due have arrived and departed.

That in Rule No. 172, the words "proper stop" be substituted for "red" in fifth line preceding "signals."

As follows (recommended change shown bracketed in italics):

PROTECT TRAIN WHEN STOPPED.

172. When a train stops or is delayed under circumstances under which it may be overtaken by another train, the CONDUCTOR OR FLAGMAN MUST GO BACK IMMEDIATELY WITH RED [*PROPER STOP*] SIGNALS A SUFFICIENT DISTANCE TO INSURE FULL PROTECTION, NOT LESS THAN ONE THOUSAND (1,000) FEET. When recalled he may return to his train, first placing two torpedoes on the rail when the conditions require it. The front of a train must be protected in the same way when necessary, by the motorman. The duty herein required of the conductor or motorman may be performed by the other when desirable for any reason.

That in Rule No. 218, second sentence, paragraph one, be changed to read as follows: "The motorman and conductor must not pass a station where such signals are displayed without receiving a train order."

As follows (second sentence of first paragraph, as now recommended shown bracketed in italics):

ISSUING ORDERS AT STATIONS.

218. To issue train orders at stations where there are operators or agents, the dispatcher will instruct the operator or agent to display a stop signal for the motorman and conductor to stop for orders. The motorman and conductor must not pass a station where such signals are displayed without reporting to the agent or train dispatcher, and until such signals have been taken down, removed or cleared. [*The motorman and conductor must not pass a station where such signals are displayed without receiving a train order.*]

When a train order is given through an agent, he must read it back to the dispatcher, and complete it in the same manner as a motorman. The conductor and motorman receiving such an order must each read it aloud back to the agent, and receipt for the same by writing their names upon it before detaching the copies intended for them.

That in Rule 229, changes be made that will insure greater care in the exchange of train orders between crews and that will provide for

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a permanent record being made to be signed by the crews thus exchanging.

As follows:

EXCHANGE AND EXPLAIN ORDERS WHEN CHANGING OFF (Present Rule.)

229. In case motormen or conductors change off before the completion of their trip, they must carefully exchange all orders they may have, and each must know that his orders are perfectly understood by the other. Changes of this kind, however, must never be made without permission from the Superintendent, unless regularly provided for in the assignment of runs.

EXCHANGE AND EXPLAIN ORDERS WHEN CHANGING OFF (Recommended Rule).

229. In case motormen or conductors change off before the completion of their trip, they must carefully exchange all orders they may have and each must know that his orders are perfectly understood by the other. Receipts must be taken by each for all orders thus exchanged on blanks provided for that purpose. Changes of this kind, however, must never be made without permission from the Superintendent, unless regularly provided for in the assignment of runs.

LEGISLATIVE AND COMMISSION RULINGS REGARDING RULES

Pursuant to instructions of the Executive Committee, your Committee has endeavored to obtain from member companies in each State data regarding action taken by the various Public Service Commissions having jurisdiction with regard to our Standard Codes of Rules, or other action that would indicate necessity or desirability of changing the codes. It has not received any reports of action taken approving or disapproving a specific code, but it does find that the Railroad Commission of Indiana, on May 28, 1912, Circular No. 86, did instruct all interurban companies to print a code of rules for the guidance of employes, said codes to be given to all persons engaged in the operation of trains and cars, and file a copy with the Commission, also providing for examinations. The circular in full is as follows:

STATE OF INDIANA
RAILROAD COMMISSION OF INDIANA
CIRCULAR NO. 86

To All Interurban Railroad Companies:

All Interurban Companies have in effect on their lines a standard code of rules governing the employes in the operation of same. There is no statutory requirement relative to the examination of the employe upon such rules. The Commission recommends and directs that all Interurban Railroad Companies shall publish printed rules for the control and operation of trains and cars on such railroads and shall deliver copies thereof to all persons engaged in the operation of such trains and cars and file a copy with the Railroad Commission of Indiana, and shall instruct such employes in the application of such rules

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and examine such employes thereon at least once in each six months after employment until the service has continued for eighteen months and annually thereafter. It is required that a record be kept of such examination for the use of said Company and for the inspection of said Commission and such other persons as may be legally entitled to inspect the same.

Said Companies are hereby required to advise said Commission of their compliance or intention to comply with this Circular.

All of which is ordered and directed by the Railroad Commission of Indiana.

RAILROAD COMMISSION OF INDIANA,

BY J. L. REILEY, *Secretary.*

Indianapolis, Indiana, May 28, 1912.

CONFERENCE WITH AMERICAN RAILWAY ASSOCIATION

During the present year, with the co-operation of Gen. George H. Harries, First Vice-President of the American Electric Railway Association, and Daniel Willard, President of the American Railway Association, arrangements for conference with the American Railway Association have been made. At the time of going to press, however, a meeting has not been held but it is expected that some time during the month of September, conference will take place at which Mr. J. N. Shannahan, President, will represent this Association, and discuss with the Transportation Committee of the American Railway Association the subject of rules of the Standard Code of the American Railway Association and the Standard Code of this Association, with a view to considering changes in rules applicable to both steam and interurban operation.

RULES FOR THE OPERATION OF BLOCK SIGNALS

It has not been deemed practicable by your Committee to attempt to evolve at this time a standard set of rules to govern the operation of block signals. In the opinion of the Committee this question, as it relates to electric railways, has not been developed to that extent where it seems possible to display a standard code. The Committee, however, recommends that the subject be continued and that this Committee be instructed to thoroughly canvass the situation with the Joint Committee on Block Signals for Electric Railways, which represents the Engineering and Transportation and Traffic Associations.

Respectfully submitted,

C. F. HANDSHY, *Chairman,*
F. A. BOUTELLE,
W. H. COLLINS,
ALEXANDER SHANE,
J. J. DOYLE,
G. H. CLIFFORD,
Committee on Interurban Rules.

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APPENDIX

AMERICAN ELECTRIC RAILWAY ASSOCIATION

29 West 39th Street, New York, N. Y.

Expressions of Opinion from Member Companies Concerning Adoption of Codes of Rules for City and Interurban Operation.

Asheville Electric Co., Asheville, N. C.

"With the exception of a few changes and the introductory preface, we have adopted rules as set forth."

Bay State Street Railway Co., Boston, Mass.

"The interurban book is not applicable to our conditions, our interurban service being in highways and subject to limitations which such occupancy imposes.

"As to City rules, we are about to revise our book, and shall consider the adoption, in so far as possible, of the standard."

Boston Elevated Railway Co., Boston, Mass.

"We have not found it feasible to put the standard rules into use on our system on account of the many local conditions which require special rules."

Brooklyn Rapid Transit Co., Brooklyn, N. Y.

"In standardizing operating rules, which is considered most desirable, it occurs to me that only those subjects should be covered where uniform practice by the member companies is possible. This would eliminate certain operating instructions, affected by local conditions, an itemized list of which might appear as a supplement to the Standard Code, leaving the framing of rules thereunder to existing needs of the various localities.

"The only additional comment I have to make covers paragraphs where brevity has been secured at the price of clearness. Experience indicates the necessity for the latter, especially when we consider the qualifications of the average railroad employe."

Cedar Rapids & Iowa City Railway, Cedar Rapids, Ia.

"While we operate an electric railway, we sometimes, when our freight traffic is especially heavy, use steam locomotives. We have always operated under the Standard Rules of the steam roads. Our reason is that these rules are the result of years of experience on the part of the steam roads, and they have in one way or another been adjudicated in the courts."

Columbus, Delaware & Marion Ry. Co., Columbus, Ohio.

"We have adopted both city and interurban rules with some few minor changes to meet with conditions which, of course, exist on different roads. We have operated under these rules since July 1st, 1910, and they have proved very satisfactory."

Columbus Railroad Co., Columbus, Ga.

"We do not operate any interurban cars. Our city cars are operated under a standard Stone & Webster Rule Book, which we understand applies to the operation of all cars in companies under Stone & Webster's management. These rules are practically the same as the Standard Code of City Rules."

Duluth Street Railway Co., Duluth, Minn.

"We are now engaged in revising our book of rules and regulations and are following very closely the general plan and arrangement of the standard code of rules as far as they are applicable in our case. A very large proportion of all the rules in our book will I think, when it is completed, be copied verbatim from the standard code."

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GALESBURG & KEWANEE ELECTRIC RAILWAY CO., KEWANEE, ILL.

"We adopted the 1909 code of city rules as standard on our city line, and do not use any other code for our interurban line, as we operate only one car on it regularly. Should our train movements become more complicated, we would be glad to avail ourselves of the standard interurban code.

"Although the changes that are made yearly in the city code make it impracticable to keep up-to-date with our rule book, we believe that the city code should continue to be changed and added to, as we feel that it does not yet cover the work as fully as it might."

INDIANA UNION TRACTION CO., ANDERSON, IND.

"This company has now in effect the standard code of rules that has been adopted by the affiliated Transportation and Traffic Association and approved by the American Electric Railway Association."

IOWA & ILLINOIS RAILWAY CO., DAVENPORT, IA.

"The Association was advised by this Company last year that it had adopted as far as possible the interurban operating rules, the use of which is being continued and corrections made from time to time."

KENTUCKY TRACTION & TERMINAL CO., LEXINGTON, KY.

"We have adopted as standard the rules as applying to both city and interurban lines, making such modifications only as were necessary to meet our particular operating conditions."

KNOXVILLE RAILWAY & LIGHT CO., KNOXVILLE, TENN.

"We are now, and have been for some time, using the Association standard code of rules for our operation, with some few changes made necessary by local conditions."

LOS ANGELES RAILWAY, LOS ANGELES, CAL.

"I consider the rules in general very good and the majority of them adapted to our service."

MEMPHIS STREET RAILWAY CO., MEMPHIS, TENN.

"We have recently formulated a code of rules for City service, using the standard code as a basis. We do not operate Interurban lines and have, therefore, not gone into the Interurban rules. As to the City rules, we heartily approve of them and believe that they embody what has been found best in actual operation by the careful operators to whom this work was entrusted."

NEW ENGLAND INVESTMENT & SECURITY CO., SPRINGFIELD, MASS.

"Owing to the fact that our interurban lines are not operated in exact accordance with certain western railways, it was not considered either desirable or necessary to have two books, hence the rules were consolidated into one book, following in practice the major portion of the American Code in so far as it was applicable to our conditions."

OKLAHOMA RAILWAY CO., OKLAHOMA CITY, OKLA.

"While we expect to adopt the standard rules for both city and interurban operation, we have decided to issue one book containing all the rules, but we are trying to arrange the numbering in such a way that no confusion will exist and will use the standard index.

"In addition, we will probably include the standard rules for track and maintenance of way employes. Also under suitable headings we will include such special rules as apply to our system and under appropriate headings will have all such instructions as have been heretofore covered in bulletin form.

"Our idea is that the rule book should be as complete as possible, thus avoiding the necessity of so many special instructions and bulletins.

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OKLAHOMA RAILWAY CO., OKLAHOMA CITY, OKLA. — (Continued).

"While getting out a combination rule book for both city and interurban divisions, we still feel that we are adopting the standard rules as approved by the Association."

PACIFIC ELECTRIC RAILWAY CO., LOS ANGELES, CAL.

"I have to advise that this company about a year ago revised its rules, Operating Department, following in a general way the substance and form of the standard code adopted by the Association, but making numerous changes of minor character to fit local conditions and make improvement in phraseology, etc. While we operate both city and interurban lines, the latter predominate, and, as our trainmen are constantly interchanged, we use only the interurban code. Inasmuch as the latter is susceptible of modification to sufficiently cover city operation, my judgment is that companies operating both systems will find it preferable to have but one set of rules."

PHILADELPHIA & WESTERN RAILWAY CO., UPPER DARBY, DELAWARE COUNTY, PA.

"As soon as you have a revised copy of the interurban rules as adopted by the Atlantic City Convention, will you see that I have two or three copies of the same, as I shall adopt this for our standard on this property."

PUBLIC SERVICE RAILWAY CO., NEWARK, N. J.

"We beg to advise that the rules in effect on this system conform generally to the Code as adopted by the Association in 1910. Our rules, in addition, contain, of necessity, local rules not covered by the standard code. We have not as yet adopted the Interurban Code, but expect to in the near future."

SIOUX CITY SERVICE CO., SIOUX CITY, IA.

"We are using the Standard Book of rules in our city service, with entire satisfaction, but not having interurban lines we are not using the Interurban Book."

TACOMA RAILWAY & POWER CO., TACOMA, WASH.

"With reference to adoption of standard rules, would say that our rules are entirely those approved by the American Electric Railway Association, although we have not taken over the rules bodily. We believe it to be a great advantage that all companies operate as nearly as possible under the same set of rules."

TIDEWATER POWER CO., WILMINGTON, N. C.

"This Company has already adopted the standard code for city and interurban operation, with such modifications as have been made necessary by local conditions."

TOLEDO, BOWLING GREEN & SOUTHERN TRACTION CO., FINDLAY, OHIO.

"This company has adopted the codes of rules with a few alterations to suit our conditions."

THE TRI-STATE RAILWAY & ELECTRIC CO., EAST LIVERPOOL, OHIO.

"Wish to state that we have adopted these rules on our lines."

TWIN CITY RAPID TRANSIT CO., MINNEAPOLIS, MINN.

"We have gone over the standard code of rules for city and interurban operation adopted by the Transportation and Traffic Association at the 1909 convention at Denver. In the main, our local as well as suburban lines conform to the adopted code. In some cases in our Trainmen's Guide, the legal requirements of this locality have made necessary slight changes in wording from the standard code of operation.

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TWIN CITY RAPID TRANSIT CO., MINNEAPOLIS, MINN.—(Continued).

"Every man on the system, which includes two suburban lines, carries a regular trainmen's guide for local operation. The suburban standard regulation orders and rules are contained in a time-table.

"Owing to the fact that we operate standard four motor cars with no trailers, cars of single end operation with gates controlling the only exit and entrance, which is at the rear, requires this company to have special rules which do not govern in many localities, and, in some cases, eliminate rules which apply to 'trailer' operation.

"So far as consistent with our operation we shall be glad to conform to the standard code as adopted by the 1909 Denver Convention."

WASHINGTON & OLD DOMINION RAILWAY, WASHINGTON, D. C.

"We are in the midst of construction work preparatory to taking over and operating 57 miles additional track that has heretofore been operated by steam. It is our intention to apply Association Rules as far as they will meet our conditions, but we have not gone into the matter in detail."

WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD CO., BALTIMORE, MD.

"This company has put into use the standard code of rules adopted by the Transportation and Traffic Association for Interurban operation."

WHEELING TRACTION CO., WHEELING, W. VA.

"We have been waiting for a copy of these rules as amended at the last Convention, expecting upon receipt of same to adopt the standard rules so far as practicable on our lines."

WINNIPEG ELECTRIC RAILWAY CO., WINNIPEG, MAN., CAN.

"We have adopted the standard rules, with certain variations so as to make them apply to our road in particular. We have no objections to the code in any respect and believe it to be as near perfect as it is possible to get it, although each individual road may require to make certain amendments affecting special cases."

Discussion of Report of the Committee on Interurban Rules

PRESIDENT SHANNAHAN:—On page 93 your attention is directed to the recommendation that Rules Nos. 197 and 377 be discussed on the floor of this Convention.

[Thereupon the Secretary read Rules Nos. 197 and 377, shown on page 93 of this volume.]

PRESIDENT SHANNAHAN:—What is your pleasure on this point, gentlemen?

MR. CHERRY:—I move the substitution of City Rule No. 197 for Interurban Rule No. 377 in the Code of Interurban Rules.

PRESIDENT SHANNAHAN:—Is there any discussion on this point? Is there any objection to the motion? The motion is, gentlemen, that Interurban Rule No. 377 read the same as City Rule No. 197.

(Motion duly seconded and carried.)

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SECRETARY DONECKER:—The next recommendation of the Committee, made after it had considered several suggestions from various sources, concerns Rule No. 92 (c), (see page 93.)

MR. COLLINS:— I would suggest, Mr. President, that the change is made to make the rule conform to the plate in the back of the Rule Book. It certainly was an oversight or a misprint in the adoption of the rules in the first place. It is merely a correction and I move that the recommendation be adopted.

(Motion duly seconded and carried.)

Secretary Donecker then read the next amendment with regard to Rule No. 92 (e), (see page 94.)

MR. W. H. COLLINS:—That is along the same lines, Mr. President, and I move that the recommendation of the Committee be adopted.

(Motion duly seconded, stated and carried.)

Secretary Donecker then read the suggested amendment to Rule No. 149. (See page 94.)

MR. EMMONS:—Will the Committee please explain the reason for suggesting the change?

MR. W. H. COLLINS:—The Committee could not see the reason for requiring two torpedoes if one torpedo does not bring about a stop. It therefore recommends the change and requires the torpedo to be placed on the proper side designated as the engineer's side.

MR. EMMONS:— Some of our motormen ride on the left hand side instead of the right so that doesn't really place it on the engineer's or motorman's side. The reason the original Committee on Interurban Rules used the two torpedoes was in order to be sure of the explosion, or be sure that the motorman would get it from either side of the car. I thought perhaps the Committee now places only one there for fear that two should be taken as a double signal and caution sign only, but in the case of the double signal they are supposed to be one hundred feet apart, so I don't think there is any danger in that. I think we should adhere to the old rule in this case.

MR. W. H. COLLINS:—This rule was intended originally to cover steam railroad crossings. The engineer almost always rides on the right hand side of the engine. That was the idea of placing it on that side.

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MR. EMMONS:— Mr. Chairman, there is one point I had in this and I intended to bring that up, the question of the desire to harmonize these rules with the American Railway Association. This would do it to that extent, and I was misled in feeling that this was a flagging rule for interurbans. I think two torpedoes would be better because of motormen being on either side. For steam railroad protection, I think the suggestion is all right.

SECRETARY DONECKER:— I think what has just been said describes the real motive of the Committee in making this change, that the old rule would tend to possibly confuse the engineer as to what particular crossing it was desired to protect.

PRESIDENT SHANNAHAN:—You have heard the motion.

(Motion duly seconded and carried.)

Secretary Donecker then read the amendment to Rule 159. (See page 94.)

MR. EMMONS:— I move the adoption of the suggested change.

(Motion duly seconded and carried.)

Secretary Donecker then read the amendment to Rule No. 172. (See page 95.)

(On motion duly seconded, the amendment was adopted.)

The Secretary then read the amendment to Rule No. 218. (See page 95.)

MR. EMMONS:—I move the adoption of the recommendation.

(Motion seconded.)

MR. W. H. COLLINS:— It was the sense of the Committee that the train should not pass without receiving an order from the dispatcher, and it elicited considerable discussion in the meeting. The Committee was not entirely in accord, but after a full and free discussion it was finally voted in favor of the proposition that they must receive an order from the train dispatcher, not a clearance from the operator. One or two members of the Committee cited cases of accidents happening where the train got away from the operator.

MR. KILBRIDE:— I would like to ask if the Committee recommended a form for the order?

MR. W. H. COLLINS:—The Committee did not recommend

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the form of order. We did not go into that, but the crew must know from the dispatcher that the signal was not set for them.

MR. KILBRIDE:— In that event, he could not issue a train order, but he would have to issue a clearance order for the train. It would have to be in the form of a clearance and not a train order.

MR. W. H. COLLINS:— Yes.

MR. EMMONS:— I think the additional word "clearance" would clear that up.

PRESIDENT SHANNAHAN:— From the dispatcher?

MR. EMMONS:— It would be from the dispatcher.

MR. W. H. COLLINS:— It is perfectly agreeable to me as a member of the Committee that it should be train order or clearance from the dispatcher.

PRESIDENT SHANNAHAN:— In order that we may have a vote on that particular point those in favor of Mr. Emmons' motion as amended will say "Aye;" contrary-minded, "No."

(Motion carried.)

MR. BRADLEY:—What was the motion?

PRESIDENT SHANNAHAN:—The motion was that the recommendation of the Committee be adopted with the addition of the words "or clearance from the dispatcher."

MR. BRADLEY:—Are not the words "from the dispatcher" entirely superfluous? If you will read the rule it already says that. He is merely the medium through which the order passes to the crew of the car and has no authority to issue of his own volition regardless of what it may be set for without the order coming from the dispatcher. I think that is the fundamental principle of the dispatching system, so that all orders affecting the movement of trains come from the dispatcher and is transmitted to the crews through many different agencies, so that therefore a train order or clearance is understood by trains and crews generally to come from the dispatcher, and I move the acceptance of the word "clearance."

MR. W. H. COLLINS:— In the present Code, as I understand it, Rule No. 218 now reads: (See page 95.) Now, the agent or operator might clear the signal for any particular train and tell them it was not for them, and under the old rule they

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would have a right to go by, but the rule was changed so they could not pass the signal until they had some assurance from the dispatcher that it was either for them or not for them.

MR. BRADLEY:— In order that I may make myself clear, Mr. President, if a block is ordered by the dispatcher he usually calls the agent or the operator, whoever is operating the block, and requests him to set the block for Train No. —, clear all other trains. That is understood, while the exact words may not be used. The block is set for a specific train. In case of serious delays or accidents or something, the signal may be set for all trains, but as a rule it is set for one train and the agent, as I understand it, can clear upon a clearance all trains except the one directly affected.

PRESIDENT SHANNAHAN:—Then your motion, Mr. Bradley, is that the question be reconsidered.

MR. BRADLEY:— I seconded the motion of the gentleman here that the word "clearance" be added.

PRESIDENT SHANNAHAN:—The situation that exists is this: The house has passed Mr. Emmons' motion as amended and in order to bring your motion properly before the house you will have to move to reconsider and strike out the other words "from the dispatcher."

MR. BRADLEY:— I did not know that the motion had been carried.

PRESIDENT SHANNAHAN:— I think it is perfectly proper for you to move a reconsideration.

MR. BRADLEY:—The words "from the dispatcher" seem superfluous, but I did not know that it had been formally approved.

MR. EMMONS:— Mr. Chairman, I think Mr. Bradley's reasoning is correct, but I think the need of its being in there is to show that the dispatcher has not given the agent the clearance and has given the agent the order to put up the order board. I feel that the word "dispatcher" should be there in order to be more definite.

PRESIDENT SHANNAHAN:— Is there any second to Mr. Bradley's motion to reconsider.

MR. BRADLEY:— I withdraw the motion.

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Secretary Donecker then read the proposed amendment to Rule No. 229. (See page 96.)

(On motion, duly seconded, the amendment was approved.)

Secretary Donecker then said: The next part of the rule simply refers to the Commission's ruling and in one instance citing that the rule be filed with the Commission.

(A motion for adoption was duly seconded and carried.)

MR. ALLEN:— I move the adoption of the Code of Rules as has been reported by this Committee and the recommendations that have been adopted at this conference using the same language and the same resolutions that were used in the three previous years, for submission to the American Association.

PRESIDENT SHANNAHAN:—You have heard Mr. Allen's motion. All those in favor will say "Aye;" opposed, "No."

(Motion carried.)

The last business to come before the meeting is the report of the Committee on Uniform Definitions. Mr. Brush will read the report.

REPORT OF THE COMMITTEE ON UNIFORM DEFINITIONS

To the American Electric Railway Transportation and Traffic Association:

GENTLEMEN.—This Committee was appointed by President Shannahan in accordance with a resolution passed by the Executive Committee during the period of the mid-year meeting in New York in January. The resolution provided that "a committee be appointed to define terms commonly used in the transportation departments of electric railways and that subsequently an effort be made to bring about the uniform adoption of such definitions with a view to standardization."

The Committee held its initial meeting in New York during the period of the mid-year meeting and discussed tentative outlines for the work. Certain definite work was allotted to the members and some progress has been made with that during the balance of the year. It was felt to be necessary to define the work allotted to the Committee a little more closely than was possible in the general terms of the resolution passed by the Executive Committee. With this purpose in mind, correspondence was entered into with the executive officers of the Association and the members of the Executive Committee who were especially instrumental in offering or urging the adoption of the resolution under which the Committee was appointed. With this correspondence as a basis and after further consideration

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by individual members of the Committee, it was decided that it would be necessary to take up for definition terms used in both urban and interurban railway systems and to secure representation on the Committee not only of companies engaged in these different classes of service but also of companies located in somewhat different sections of the country, in order that terms of particular local significance might be brought to the attention of the Committee. When a suggestion that the Committee be increased was made by your Chairman to the President of your Association, another member was appointed.

The Committee has compiled lists of terms in common use in the transportation departments of large city and interurban systems. It is apparent from the extent to which this work has already been carried that there is a real need of standardization of terms, not only with different companies and in different localities of the country, but also in the same company, where conflicting terms are sometimes used to express the same meaning. Some of these terms are slang phrases adopted by trainmen or others in the service of the company, while others are the terms that have been prescribed or adopted as the best available without thought of possible conflict with standards prevailing elsewhere. These conditions make it important for the Committee to undertake as thorough a canvass as is practicable, in order to judge the sentiment of the various member companies in regard to the application of standard terms. The Committee was unable to continue far enough with its work during the current year to do this satisfactorily and thoroughly, and for that reason it asks to be continued for another year.

Definitions of terms in use in the transportation department will be of value to member companies if they are thoroughly representative of standard practices on the various lines and are, therefore, adaptable immediately and appropriately to practically existing conditions. Such definitions will not be acceptable to the companies if they fail to recognize the varying requirements of the companies. The Committee, however, believes that a certain number of terms can be standardized without a serious disarrangement of existing practices and that this should be done. Its plan is to offer a number of definitions for action at the next annual Convention if it shall be the pleasure of the Association to give it authority to continue this work for another year.

M. C. BRUSH, *Chairman.*
W. C. CALLAGHAN,
I. H. MCEWEN,
A. BENHAM,
Committee on Uniform Definitions.

(On motion, duly seconded, the report was adopted.)

The Convention then adjourned to meet on Tuesday morning at 9:30.

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TUESDAY MORNING SESSION

OCTOBER 8, 1911

JOINT MEETING OF TRANSPORTATION AND TRAFFIC AND ENGINEERING ASSOCIATIONS, BROWN ROOM, SADDLE AND SIRLOIN CLUB.

President Ackerman, of the Engineering Association, called the meeting to order with Vice-president Hegarty, of the Transportation Association jointly presiding.

PRESIDENT ACKERMAN:— Gentlemen, the report before you this morning is that of the Joint Committee on Block Signals for Electric Railways; this Committee, as you know, is a joint committee of the Engineering Association and the Transportation and Traffic Association. I will call upon Mr. Waldron, chairman of the Committee, to present the report.

MR. WALDRON:— Mr. President and gentlemen, your Committee last year found that there was no general system of signal indications. Neither the companies nor the manufacturers had a certain indication maintaining any uniformity. Your Committee believed, therefore, that the most important thing that it could do would be to decide upon a system of aspects which could be universally used. This would be of some help to the railroads because it would have a tendency to cheapen signal installations, and it would also assist the manufacturers, as they would not need to carry a large number of different parts in stock.

REPORT OF THE JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS

To the American Electric Railway Transportation and Traffic Association, and the American Electric Railway Engineering Associations:

GENTLEMEN.— Your Committee was instructed by the Executive Committee of the two Associations to continue the study of signaling instructions and methods and make recommendations as follows:

1. For signaling single-track suburban railways for headway between 5 and 30 minutes and speed not exceeding 20 miles per hour.

2. For signaling single-track interurban railways for headway between 1 and 10 minutes and speed not to exceed 30 miles per hour.

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3. For signaling single-track interurban railways for headway not less than one hour and speed between 40 and 60 miles per hour.

4. For signaling single-track interurban railways for headway as frequent as 15 minutes with trains in several sections and speed between 40 and 60 miles per hour.

5. For signaling double-track interurban railways for headway as frequent as five minutes and speed between 40 and 60 miles per hour.

Your Committee has held four meetings. The first was held in New York City on Thursday, January 25, 1912, and all the members of the Committee were present.

The second meeting was held in Chicago March 19, 1912, all members of the Committee again being present. In addition, there were present on invitation of the Committee the following engineers and representatives of signal manufacturers: W. W. Salmon and W. K. Howe, General Railway Signal Co., Rochester, N. Y.; L. Frederick Howard, H. W. Griffin, and Harold McCready, The Union Switch & Signal Co., Swissvale, Pa.; J. J. Hubbard, Federal Signal Co., Albany, N. Y.; Carl P. Nachod, Nachod Signal Co., Philadelphia, Pa.; and John J. Ruddick and J. W. Putman, United States Electric Signal Co., West Newton, Mass.; M. H. Hovey, Consulting Signal Engineer for the Railroad Commission of Indiana and Safety Service Expert for the Railroad and Tax Commission of Wisconsin. L. E. Gould, Western Manager of the *Electric Railway Journal;* and A. D. Cloud, Editor of *The Signal Engineer* were also present. Mr. Gould acted as secretary of the meeting. At this meeting there was a general discussion on signal aspects.

The third meeting was held in Rochester, June 14 and 15, 1912. There were present at this meeting C. H. Morrison, John Leisenring and J. M. Waldron of the Committee; W. H. Howe and H. M. Sperry, General Railway Signal Co.; H. W. Griffin, The Union Switch & Signal Co.; L. E. Gould, *Electric Railway Journal;* and A. D. Cloud, *The Signal Engineer.* Mr. Cloud acted as secretary of the meeting.

The fourth meeting was held at Buffalo, July 27, 1912. There were present Mr. Emmons and Mr. Waldron of the Committee; L. F. Howard and H. W. Griffin, The Union Switch & Signal Co.; W. K. Howe and H. M. Sperry, General Railway Signal Co.; L. E. Gould, *Electric Railway Journal;* and A. D. Cloud, *The Signal Engineer.* Mr. Cloud acted as secretary of the meeting.

The Committee work was subdivided as follows:

1. Mr. Waldron was assigned the work of bringing the progress report on signaling up to date;

2. Mr. Emmons was given the Data Sheets and the bibliography on electric railway signaling and allied subjects, with instructions to bring the same up to date;

3. Mr. Conn was assigned the collection of data regarding rulings of the Interstate Commerce Commission and the various state railway commissions;

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4. Mr. Morrison and Mr. Waldron were given the general subject of standards for signal indications and aspects;

5. Mr. Leisenring and Mr. Merwin were appointed a Subcommittee to confer with the signal companies and report as to their findings and recommendations with respect to the proper methods of solving the signaling problems presented in the instructions of the Executive Committees.

The Committee has kept in close touch with the work of the Railway Signal Association, which in the early part of 1912 appointed a special Committee on Signaling Requirements of Electric Railways, consisting of those members of this Committee who are also members of the Signal Association, viz., Messrs. Morrison, Leisenring and Waldron. Mr. Waldron also being chairman of this special Committee. The outline of work proposed by the Board of Direction of the Signal Association authorizes the Committee to bring to the attention of the other committees the peculiar requirements and conditions of electric railway operation that should be taken into account in their work, and to recommend such changes in the standards and recommended practices of the Signal Association, together with such amendments to the conclusions of the other committees as may be found necessary to meet the peculiar requirements and conditions affecting signaling on electric railways.

DIGEST OF BLOCK SIGNAL LAWS AND RULINGS

A bill intended to convey full authority upon the Interstate Commerce Commission, the full text of which was printed in last year's report (pages 193–198, 1911 Engineering Association Proceedings) to require block signals on roads engaged in interstate commerce, has been introduced in each session of Congress since 1903, and was last introduced by Representative Esch in the House of Representatives on April 5, 1911. This bill, known as the Esch Bill, H. R. 1668, is still pending in the House of Representatives.

The following states have no laws or commission rulings bearing upon the subject of block signals, with the exception of crossing protection, although some of the states have statutes governing interlocking:

Colorado.	Connecticut.	Florida.
Iowa.	Maine.	Michigan.
Nevada.	Nebraska.	New Hampshire.
New Jersey.	New Mexico.	North Carolina.
Oklahoma.	Pennsylvania.	Texas.
Virginia.	Washington.	Wyoming.
Louisiana.	Georgia.	Oregon.
Illinois.	Kansas.	Missouri.
North Dakota.	Vermont.	Wisconsin.*

* A Wisconsin law in effect but not included in this report is shown in page 200 of this volume.

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The railway commissions in Arkansas, Kentucky, Mississippi, Montana, Ohio, Rhode Island, South Carolina, South Dakota and Tennessee have no jurisdiction over electric railways insofar as block signaling is concerned.

The States of Idaho and Utah have no railroad or public service commissions.

No replies were received to letters addressed to the Railroad Commissions of Alabama, Arizona, Delaware and Maryland.

In California the Public Utilities Act, which became effective on March 23, 1912, gave the Railroad Commission jurisdiction over the service of railways in that state including block signals and safety device. No rulings, however, have as yet been issued by that Commission.

The Indiana Railroad Commission gives no reference to rulings which have been made by it since the compulsory law requiring block signals became effective January 1, 1912. This law was referred to in last year's report (page 198, 1911, Engineering Association Proceedings. The law of 1907 simply provided for an approved block system. In view of the court decision that the language was not definite enough to support an action, and in order that there might be no doubt, the Indiana Railroad Commission drafted an amendment to the Act of 1907. This bill passed and is now Chapter 188 of the Acts of 1911. The essential features of the present law are contained in the following paragraphs:

"That after the first day of January, 1912, it shall be unlawful for any person, firm or corporation, or lessee or receiver of any person, firm or corporation, which shall own or operate any line of steam or interurban railroad in this state to operate any train or car over such railroad by steam, by electric power or other power, unless such railroad is equipped with and has in operation an automatic block system or other system approved by the Railroad Commission of Indiana for the control of train or car movements thereon, unless the time therefor be extended by such Railroad Commission.

"Full power and authority are also hereby conferred upon such Commission to permit, authorize and order in place of the automatic block, either a controlled manual block, or a manual block, or a dispatcher's block, or any other form of block or other signaling system that is or may be hereafter devised or used, if in the judgment of such Commission it shall be made to appear that a controlled manual block, or a manual block, or a dispatcher's block, or any other form of block or other signaling system now or hereafter devised or used shall reasonably conserve the safety of life and property, and whenever such order is made by the Railroad Commission, and such other form of block or other signaling system is installed, operated and maintained in obedience to such order, it shall be taken and held as a full compliance with this act."

Power is conferred upon the Commission to extend the time upon a showing of a reasonable necessity for such extension and also to relieve any such carrier if it shall be made to appear that the volume of traffic is such that trains can be dispatched without hazard to life or property. The penalty for violation is $1,000 per week. Under

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the first act and the amendment there has been and will be a great deal of the mileage of the roads in the state equipped with adequate block systems. The compulsory law is pronounced successful. Not only has the block signal mileage increased, but the systems now in operation in the state are, in the opinion of the Commission, more efficient than they formerly were, and during the next two years the Commission expects to accomplish a great deal in the direction of efficient block signaling.

In Massachusetts, Minnesota, and New York the railway and public service commissions have authority to require the installation of block signals, but it does not appear that any general rulings on this subject have been made by these commissions, although installations of block signaling protection have been required in a few cases.

The Board of Railway Commissioners of Canada advise that the matter of block signals for electric railways in the Dominion has been referred to a committee which has not yet made a report.

SUMMARY OF THE DATA SHEETS AND BLOCK SIGNALS TO BE INSTALLED DURING 1912 BY ELECTRIC RAILWAYS

Only 50 companies out of the total membership of 365 in the Association replied to the Data Sheets sent out last year. In view of this,—and in order to get complete data as to the conditions of operation on electric railways, and such a number of opinions as would be of the most value to your Committee in making its recommendations,—it was considered advisable to repeat the questions of last year in the Data Sheet sent out this year. The summary of the replies to this Data Sheet is presented herewith in Appendix C.

The report of the 1911 Committee, referred to the mileage now equipped with block signaling on the railways of the United States as of January 1, 1911. During 1911 this was increased by 5,142 miles, making the total number of miles operated under the automatic block system on January 1, 1912, 20,335, the manual mileage 56,075, and the total length of road operated under the block system 76,410 miles. The increase in the automatic signaled mileage in 1911 was over 100 miles greater than the increase in manual block mileage.

The Report of the 1911 Committee also contained a short summary of the conditions governing electric railway signaling and its necessity under present conditions of rapid growth in traffic and the operation of heavy equipment at high speed. The fundamental differences between steam and electric road operation were also referred to at length.

With respect to two-position signaling on electric railroads your Committee considered it advisable to include in its report a short summary of present practice. The development of signaling on electric railways has been subject to the same influences that had so much to do with the growth of signaling on steam roads. Lack of recommended standards; widely diverse geographical conditions, and

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local requirements of each situation; patents on signaling apparatus and systems; and various other less effective but equally important considerations have rather fostered than retarded the multiplicity of signal forms and appliances which characterize present day electric road signaling. Semaphore and disk signals are used for day indications, although lights—red for stop and green or white for proceed—are universally employed for night signals. The semaphores are operated in the upper and lower right-hand quardrants and the upper left-hand quadrant, and give indications in two and three positions in each of these quadrants. On some roads the signal blade is suspended from the center instead of the end. The stop indication is universally given with the semaphore arm horizontal, the proceed-with-caution indication is given sometimes with the arm at 45 deg. and sometimes with a forked end arm at 60 deg. from the horizontal. The proceed signal is given both by square-end and pointed-end blades in the vertical and 60-deg. position.

On account of the many designs and systems of signals now being installed (many of them in an experimental stage) and the great number of efforts being made to work out a satisfactory and inexpensive system of signals for electric railroads, it has not been considered advisable on the part of your Committee to make definite recommendations in answer to the queries contained in the report of the 1911 Committee on Block Signals.

CONCLUSIONS AND RECOMMENDATIONS

Your Committee recommends as "Standard" practice the following:

1. In all signaling the use of the three fundamental indications:
   - (*a*) Stop.
   - (*b*) Proceed-with-caution.
   - (*c*) Proceed.

2. *Where* semaphore signals *are used they shall be so arranged as to indicate* (indicating in) three positions, in the upper left-hand quadrant.*

* Italicised words indicate amendment at Convention.

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3. The following aspects in three-position signaling:

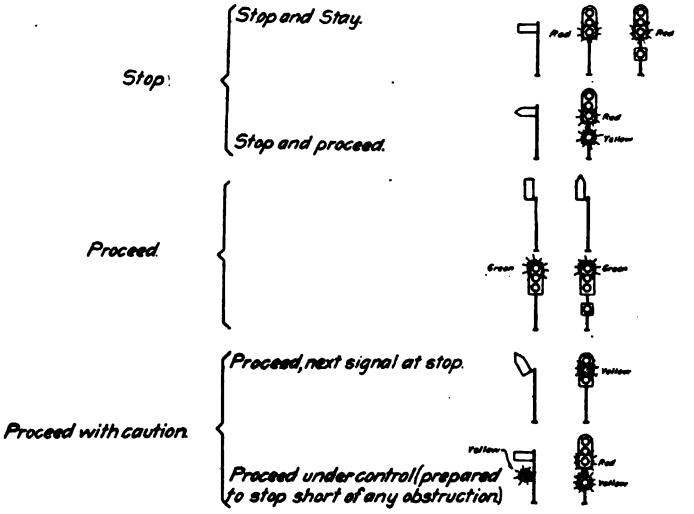

FIG. 1. SHOWING ASPFCTS IN THREE-POSITION SIGNALING.

4. Your Committee recommends as good practice in two-position signaling the following aspects:

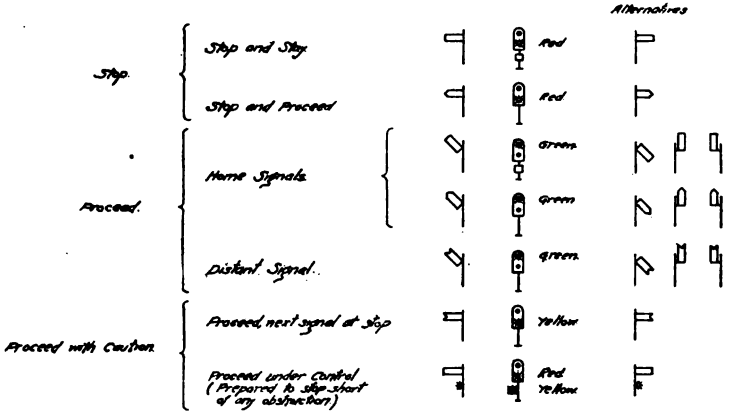

FIG. 2. SHOWING ASPECTS IN TWO-POSITION SIGNALING.

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5. Your Committee recommends, for high-speed interurban service, that automatic signals be controlled by the use of continuous track circuits, and that expenditures be concentrated on continuous track circuit control with a cheaper form of indication in preference to a more expensive form of signal and a less reliable control.*

(5) 6. Your Committee recommends that the Committee for 1913 continue the study of the many systems of signaling now being installed, and, if possible, endeavor to answer the queries propounded by the 1911 Committee, modified, however, as follows:

First: Recommendations for signaling single-track suburban railways — headway between 5 and 30 minutes — speed not exceeding 20 miles per hour.

Second: Recommendations for signaling double-track suburban railway — headway between one and ten minutes — speed not exceeding 30 miles per hour.

Third: Recommendations for signaling single-track interurban railway — headway not less than one hour — speed 40 to 60 miles per hour.

Fourth: Recommendations for signaling single-track interurban railway — headway as frequent as 15 minutes with trains in several sections — speed 40 to 60 miles per hour.

Fifth: Recommendations for signaling double-track interurban railways — headways as frequent as five minutes — and speed 40 to 60 miles per hour.

Respectfully submitted,

J. M. WALDRON, *Chairman,*
C. D. EMMONS, *Vice-Chairman,*
C. F. CONN,
C. H. MORRISON,
B. E. MERWIN,
JOHN LEISENRING,

Joint Committee on Block Signals for Electric Railways.

* This recommendation referred back to Committee by Convention and ordered stricken from report.

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APPENDIX A

SUMMARY OF INSTALLATIONS OF SIGNAL APPARATUS SUBSEQUENT TO THE 1911 REPORT

The report of the 1911 Committee on Block Signals was accompanied by:

Appendix A, Block Signal System.
" B, Fundamental Principal of Control Circuits.
" C, Descriptions of Typical Signaling Plans for Electric Railways.
" Ca, Curve Protection.
Cb, Train Dispatchers Control of Signals.
" D, Absolute Permissive Block System.
" E, Light Signals.
" F, Automatic Train Stops.
" G, Miscellaneous Signal Apparatus.
" H, Automatic Block Signals on the Illinois Traction System. (An abstract of an article by John Leisenring, Signal Engineer, appearing in the *Electric Railway Journal* for June 24, 1911.) Automatic Block Signals and Train Stops on the Interurban Line of the Washington Water Power Co., appearing in the *Electric Railway Journal*, for Dec. 17, 1910.
" I, Kinsman Block System.
" K, Nachod Signal System.
" L, Dispatchers Signal System.

This comprehensive descriptive matter presented in general the fundamental principles on which practically all of the signal systems depend for their operation and also illustrated the chief features of the designs of apparatus on the market. Accordingly, your Committee will undertake only to set forth brief descriptions of new or improved apparatus that have been developed since the preparation of the previous report, together with some statements by the manufacturers regarding installations.

Installation by The Union Switch and Signal Co.

This company has furnished material for the installation of 52 miles of block signal protection with continuous track circuits on interurban roads during the six months ending July 1, 1912. This territory is divided into 55 blocks, protected by 80 semaphore signals and 46 light signals.

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These figures include certain portions of the signaling on the Rochester, Syracuse & Eastern and the Illinois Traction Systems, but do not include 32.7 miles previously installed on the Rochester, Syracuse & Eastern and 80 miles installed on the Illinois Traction System, prior to the year 1912. The above figures are also exclusive of the signaling on the New York, Westchester & Boston Railway and other heavy suburban electric traction roads. The signals have been installed on seven different railroads in the States of New York, Pennsylvania, Maryland, Indiana, Illinois, North Carolina and California — four of these have been initial installations and three extensions of present signal systems.

This signaling provides, in single track work, for each car to be fully protected in the rear as well as head-on, *i. e.*, but one car is allowed in a block at any one time. All installations employ alternating current, this being used for low voltage track circuits and for 110 volt semaphore and light signals.

No propulsion other than the regular signaling current is employed for signaling purposes. The current for the signaling system is distributed by means of separate mains which may also supply station and switch lighting. This makes the signaling independent of interruptions and low voltage conditions, which would be incidental to its supply by the propulsion or lighting systems.

All of this signaling is controlled by continuous track circuits only, which insures the signals remaining in the danger position as long as the block which they govern is occupied. Each switch which is not trailed through is equipped with circuit controllers so arranged as to hold to "danger" all signals governing the block in which the switch is located when the points are not correctly set for the main line.

All of this signaling has been installed with the "double rail" track circuits, which provide a two-rail return for the car propulsion current.

The list includes what is, up to the present time, the largest installation of high grade light signals for automatic track circuit block signaling purposes on any interurban road and also an installation that has been made in a remarkably short length of time.

All of these installations, with one exception, are on roads having 600 or 1,200 volt direct current propulsion, the exception being that on the Chicago, Lake Shore & South Bend Railroad, where 6600 volts a. c. is employed.

Power for each of these installations is taken from auxiliary apparatus consisting of transformers and switchboards located in substations whereby available a. c. energy is transformed to 2200 volts and distributed over the signal territory. Connected to this 2200 volt line are transformers provided with secondaries giving 10 volts for the track and 110 volts for operating the signals and lights.

The line wire equipment for these installations requires two 2200

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volt and three or four 110 volt line wires, extending the length of the signaled territory. The former are generally carried on a separate two-pin cross arm, but in some cases all are carried on one cross arm. Transformers, high tension plug cutouts and lightning arresters are mounted on additional short arms located on the regular trolley or on stub poles.

All of the semaphore signals installed by this Company to date on interurban roads are operated by the Style-B mechanism, of which there are over 55,000 in service on steam and electric railroads. All of the semaphores on interurban roads are of the two-position type, and mostly operate in the upper left-hand quadrant. The others operate in the lower left-hand quadrant or as center-suspended blades.

The light signals which this company has installed on interurban roads are of two sizes, one having 5 in. the other 8 in. lenses, but are otherwise similar for they are constructed of cast iron and are provided with hoods and background shields. The home signals have one red and one green lens, whereas the distant signals are provided with one yellow and one green lens, Each lens has behind it two lamp bulbs wired in multiple as it is assumed that only one lamp will burn out at a time and hoods are provided over the lenses to offset the effect of the sun. No reflectors are employed. On four installations of light signals the electric arc headlights located just above the floor level of cars are found to have no effect on the distinctness of the indication.

The lamps employed in these signals are of the Tungsten type and the energy required for one entire signal is less than that required for one 16 c. p. carbon lamp.

To provide an indication for movements onto the main track from switches at special locations, switch indicators, or miniature unlighted signals are provided, having small semaphores and are mounted in iron cases on iron posts about four feet in height.

Diagrams of several of the installations (Figs. 3, 4, 5 and 6) are presented as interesting studies in the location of the signals and signal controlling limits, the latter shown by lines leading from the signal to the end of the territory controlling the same.

The foregoing is a general statement concerning all these installations and the following, a more detailed description of each:

ROCHESTER, SYRACUSE & EASTERN RAILROAD

(Baldwinsville to Fulton, N. Y.)

This signaling, the fourth installation of The Union Switch and Signal Company's apparatus on this railroad, presents no novelty over prior installations on this system.

The additional, or new, protection extends over 10.7 miles of track divided into three blocks, each block being provided with a preliminary and two normal clear semaphore signals.

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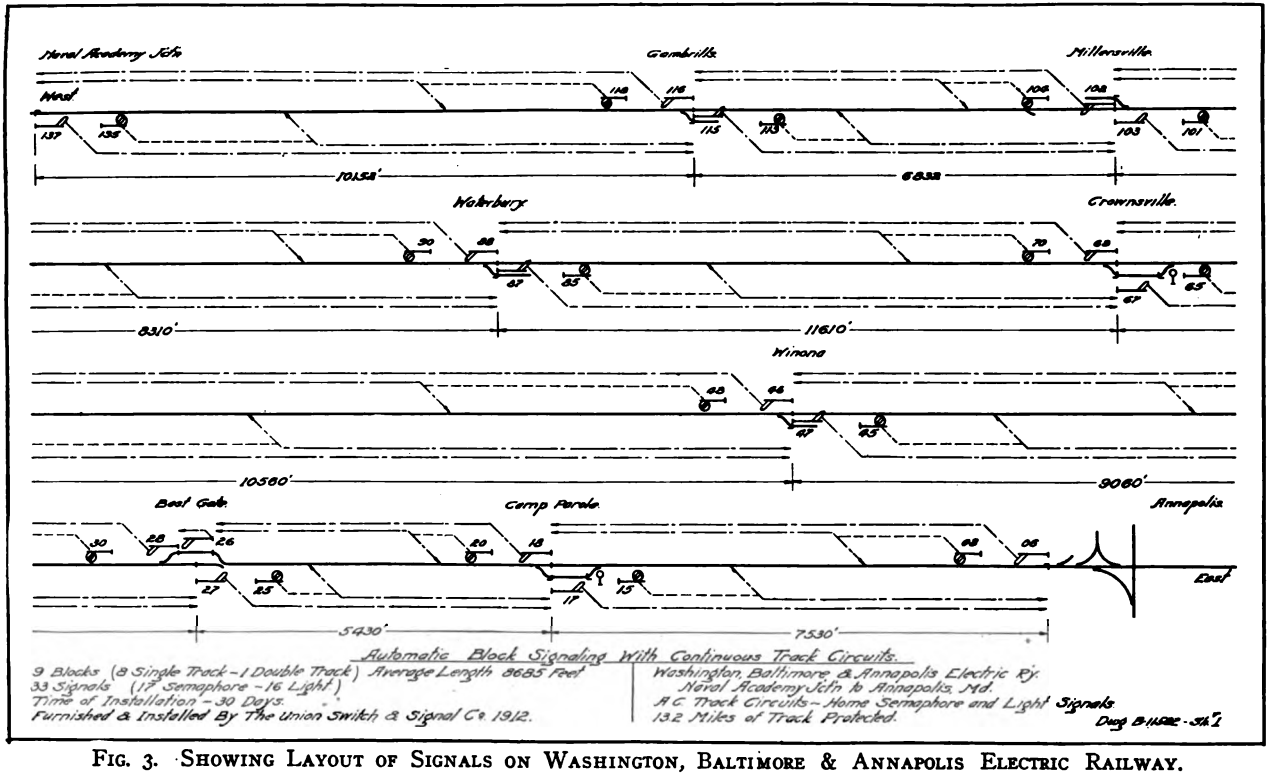

FIG. 3. SHOWING LAYOUT OF SIGNALS ON WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY.

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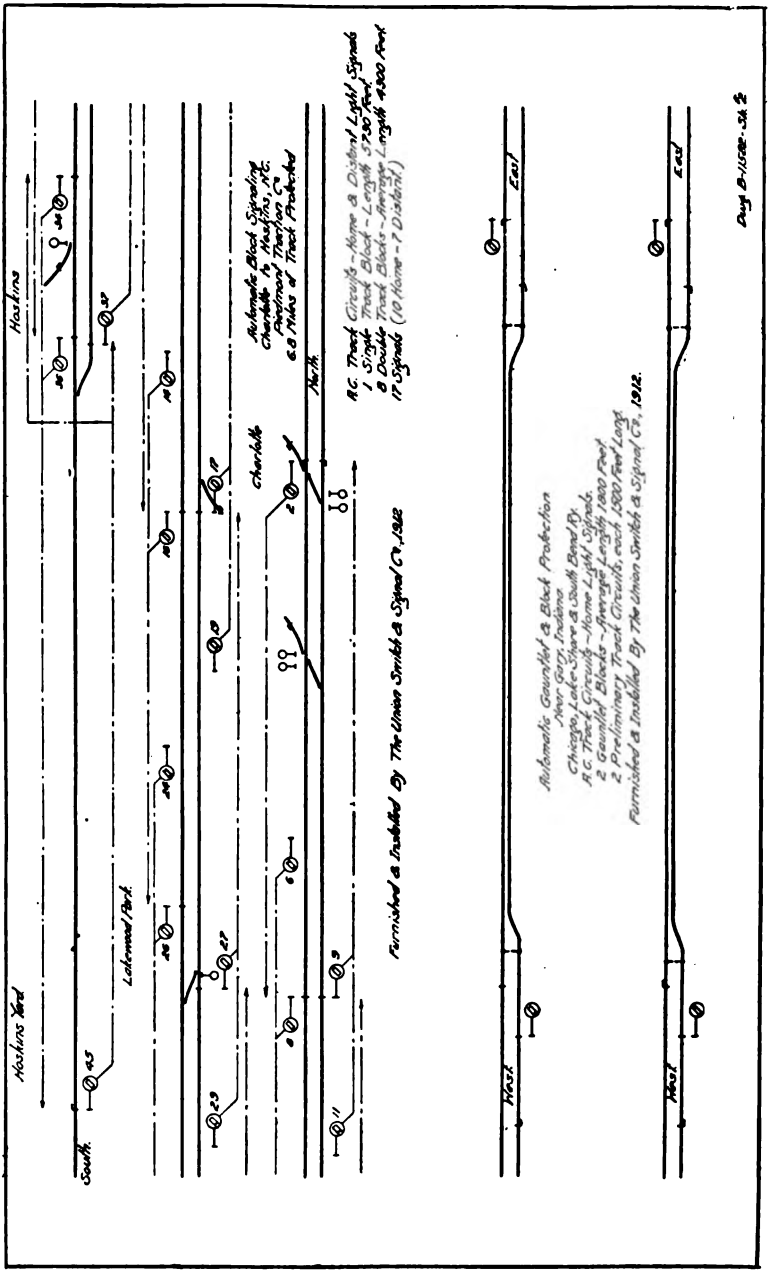
Hastings
Hastings Road
South
Lakewood Park
Charlotte
North
Automatic Block Signaling
Charlotte to Hastings, N.C.
Chautauqua Traffic Co.
6.8 Miles of Track Protected
N.C. Track Circuits - Home & Distant Light Signals
1 Siding
Track Block - Length 3500 Feet
2 Double
Track Blocks - Average Length 4800 Feet
17 Signals (10 Home - 7 Distant)
Furnished & Installed By The Union Switch & Signal Co., 1912
West
East
Automatic Gauntlet & Block Protection
Near Gary, Indiana
Chicago, Lake Shore & South Bend Ry.
N.C. Track Circuits - Home Light Signals.
2 Gauntlet Blocks - Average Length 1800 Feet
2 Preliminary Track Circuits, each 1500 Feet Long.
Furnished & Installed By The Union Switch & Signal Co., 1912.
Dwg B-1582-Sht 2

FIG. 4 SHOWING LAYOUT OF SIGNALS ON CHICAGO, LAKE SHORE & SOUTH BEND RAILWAY.

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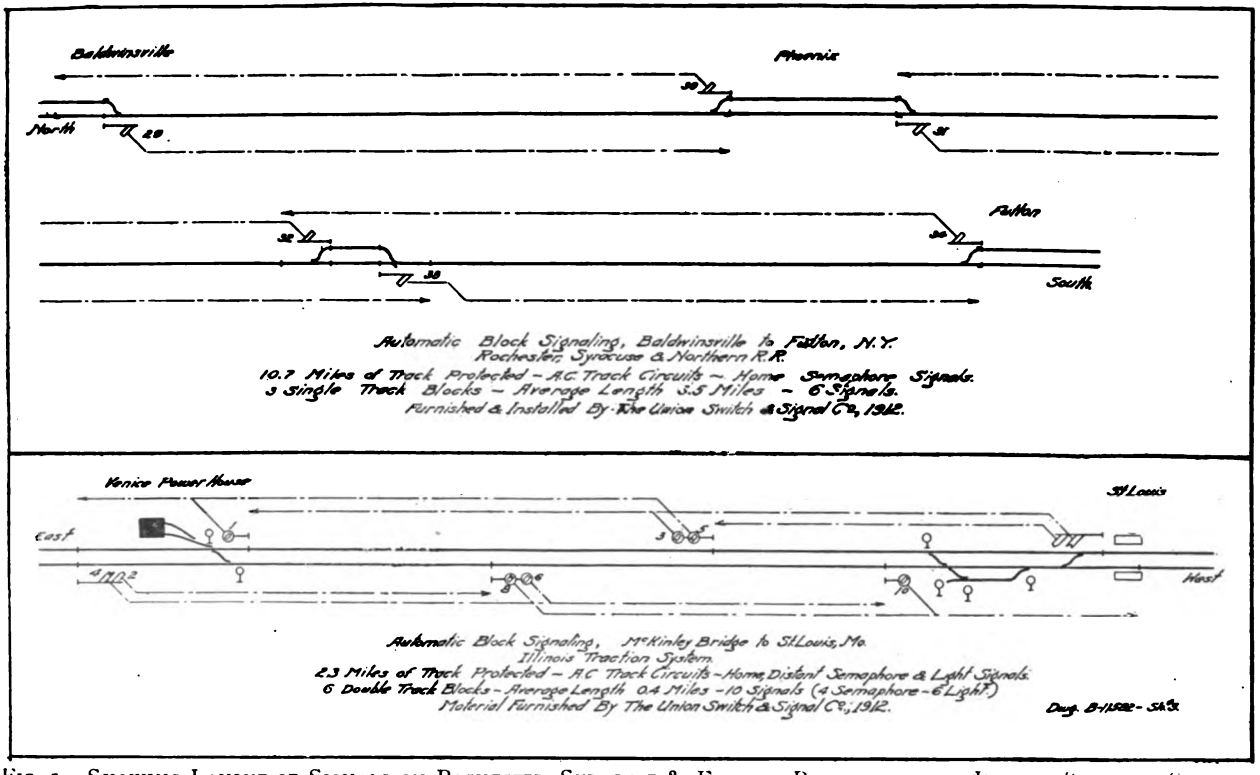
Baldwinsville
Phoenix
North
28
30
31
Fulton
32
33
South
Automatic Block Signaling, Baldwinsville to Fulton, N.Y.
Rochester, Syracuse & Northern R.R.
10.7 Miles of Track Protected – A.C. Track Circuits – Home Semaphore Signals.
3 Single Track Blocks – Average Length 3.5 Miles – 6 Signals.
Furnished & Installed By The Union Switch & Signal Co, 1912.
Venice Power House
St Louis
East
West
Automatic Block Signaling, McKinley Bridge to St Louis, Mo.
Illinois Traction System.
2.3 Miles of Track Protected – A.C. Track Circuits – Home, Distant Semaphore & Light Signals.
6 Double Track Blocks – Average Length 0.4 Miles – 10 Signals (4 Semaphore – 6 Light)
Material Furnished By The Union Switch & Signal Co., 1912.
Dwg. B-11282 - 5A St

FIG. 5. SHOWING LAYOUT OF SIGNALS ON ROCHESTER, SYRACUSE & EASTERN RAILROAD AND ON ILLINOIS TRACTION SYSTEM.

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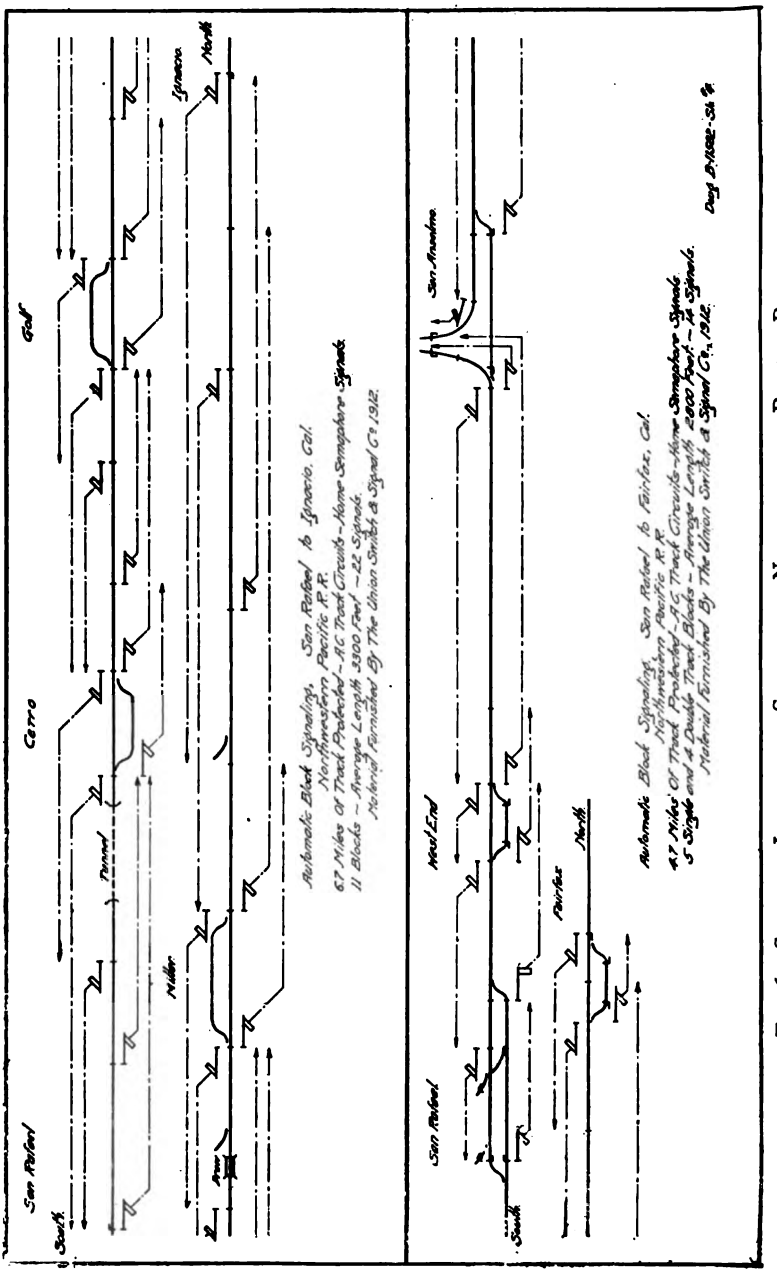
San Rafael
Corte
Golf
South
Tunnel
Greenbrae
North
Miller
Automatic Block Signaling, San Rafael to Greenbrae, Cal.
Northwestern Pacific R.R.
6.7 Miles of Track Protected by A.C. Track Circuits-Home Semaphore Signals
11 Blocks - Average Length 3300 Feet - 22 Signals.
Material Furnished By The Union Switch & Signal Co. 1912.
San Rafael
Novel End
San Anselmo
South
Fairfax
North
Automatic Block Signaling, San Rafael to Fairfax, Cal.
Northwestern Pacific R.R.
4.7 Miles of Track Protected by A.C. Track Circuits-Home Semaphore Signals
5 Signals and 4 Double Track Blocks - Average Length 2600 Feet - 10 Signals.
Material Furnished By The Union Switch & Signal Co. 1912.

FIG. 6. SHOWING LAYOUTS OF SIGNALS ON NORTHWESTERN PACIFIC RAILROAD.

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The installation shown in Fig. 5 is divided into two sections by a short stretch of double track at Phoenix and the longer section is in turn divided into two blocks by a passing siding about midway of the distance. This siding and the main track between its fouling points includes one track circuit, controlling only Signals 31 and 34.

The signals are the Union Style-B type with center suspended blades, and the balance of the apparatus is practically the same as that described in the 1911 report relating the Illinois Traction System.

PIEDMONT TRACTION COMPANY

(Charlotte to Hoskins, N. C.)

This installation has ten home and seven distant light signals protecting 6.8 miles of line, most of which is double track. Reference has already been made to this installation on account of the number of light signals controlled by continuous track circuit blocking. Distant signals are provided for the majority of the home signals, these distants being used as repeaters controlled directly by the home signal in advance. Switch indicators are provided at various points to further protect and expedite traffic. The traffic over this signaled territory is city, interurban and freight, with a large pleasure business between Charlotte and Lakewood Park.

The layout of the signals with the controlling limits of each is shown in Fig. 4, and comprises nine blocks, eight of which are on the double track and one on the single track. The signals are of the 8 in. lens type, while the balance of the apparatus is similar to that described in the 1911 report relating to the Illinois Traction System signaling.

CHICAGO, LAKE SHORE & SOUTH BEND RAILWAY

(Near Gary, Indiana.)

This installation consists of two gauntlet track protections, each having two signals protecting the traffic passing over viaducts where the view is obscured by grades as well as curves. Each of these blocks is about 1,800 ft. long and on one end of each a preliminary is provided which permits but one car accepting a clear signal at any one time. The track circuits are arranged so that the signals will clear up as soon as a car leaves the fouling point of the gauntlet.

The signals employed in this installation are of the same type as described under the "Piedmont Traction Company" and the track arrangement is shown in Fig. 4.

WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY COMPANY

(Naval Academy Junction to Annapolis, Md.)

The Washington, Baltimore and Annapolis Electric Railway connects the three cities named in its title, by a first class, high speed electric

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line, having double track between Baltimore and Washington and single track from a point called Annapolis Junction, where it connects with the Baltimore and Ohio Railroad, to Annapolis.

This single track line is 20 miles in length, and the eastern division, or that portion from Naval Academy Junction to Annapolis, which is a distance of 13.2 miles, was signaled in the thirty days preceding the Democratic Convention of this year — thus establishing a record for quick installation of a complete system of automatic protection.

The traffic over this road is passenger, local freight and through freight. Trains of more than one car are used for passenger traffic as conditions demand. A shuttle or city service is also maintained between Annapolis and Camp Parole.

On special occasions regular steam trains of the Baltimore & Ohio Railroad and the Pennsylvania Railroad convey a large number of passengers to the Naval Academy exercises at Annapolis over this line. This section was built as a steam road about 1836 and retains the many original curves, almost all of which, being in cuts, allow only a short view of the roadway.

The layout of tracks and signals with signal controlling limits is shown in Fig. 3.

There are four stub and three double ended sidings on this line, one of which, "Best Gate," is a regular meeting point for scheduled cars. At this siding the switches are set for all cars to take the right hand track and trail through the exit switch. At other double-ended sidings cars proceed at speed on the main line if they have no meets. Whenever possible these double-ended sidings are used for meets with long freight trains.

All schemes for single track automatic signals, prior to this installation, employed a preliminary at one or both ends of the block in order to prevent two opposing cars from simultaneously entering a block under clear signals. This, under normal conditions, operates perfectly, but with a deranged schedule may cause either further delay to a car already late or require signal apparatus at the entrance to a preliminary to prevent such delay.

A further study of preliminaries and their effects can be secured by a reference to the 1911 report of this Committee, but it cannot be denied that their elimination is desirable if the substitute does not introduce unsafe or undesirable features. With a view to overcoming the objection to preliminaries, The Union Switch & Signal Company, by the substitution of two additional signals, eliminated them. These signals are of the 5 in. lens light type. This scheme of signaling with semaphore signals at the ends of the blocks was adopted by Washington, Baltimore and Annapolis Electric Railway Co. As the scheme is entirely new and is the first installation of such an arrangement, it will be described somewhat in detail. Each signal is numbered according to the miles, and nearest tenth, from Annapolis.

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Eastbound signal numbers end in an odd tenth because eastbound trains are odd-numbered whereas westbound signal numbers end in an even tenth for the same reason.

The blocks extend from siding to siding and each has four signals,

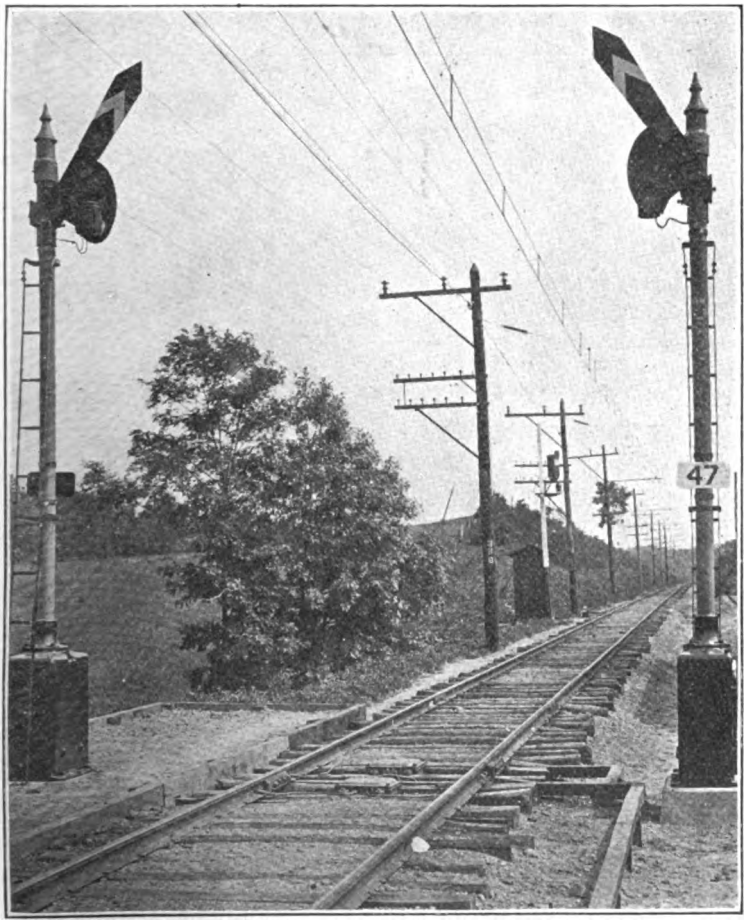

FIG. 7. SHOWING SEMAPHORE SIGNALS ON WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY.

two semaphores, one at each end of the block, and two light signals, each about 1000 ft. or more in advance of the semaphore signals. Referring to Fig. 3, the block between Gambrills and Millersville has

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semaphore Signals 115 and 102, with light Signals 113 and 104 respectively, in advance of the semaphores.

The one track section for this block has its transformer, or source

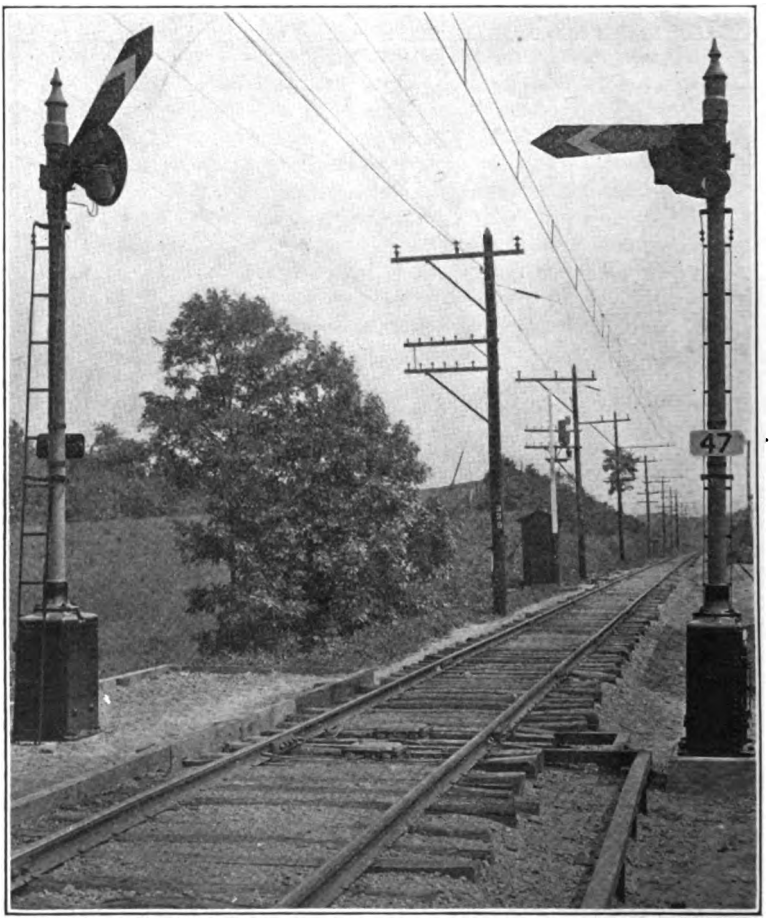

FIG. 8. SHOWING SEMAPHORE SIGNALS ON WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY.

of energy, in the center and operates two track relays. One of these relays, located at Signal 115, is controlled by the track to a point about 1000 ft. or more *east* of the center of the block, and the other,

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located at Signal 102, is controlled from this signal to a point about 1000 ft. *west* of the center.

Each semaphore signal is controlled by *both* track relays or the entire block. Each light signal is controlled by one track relay only, i. e., the one at the opposite end of the block and, therefore, by the two-thirds of the block at that end.

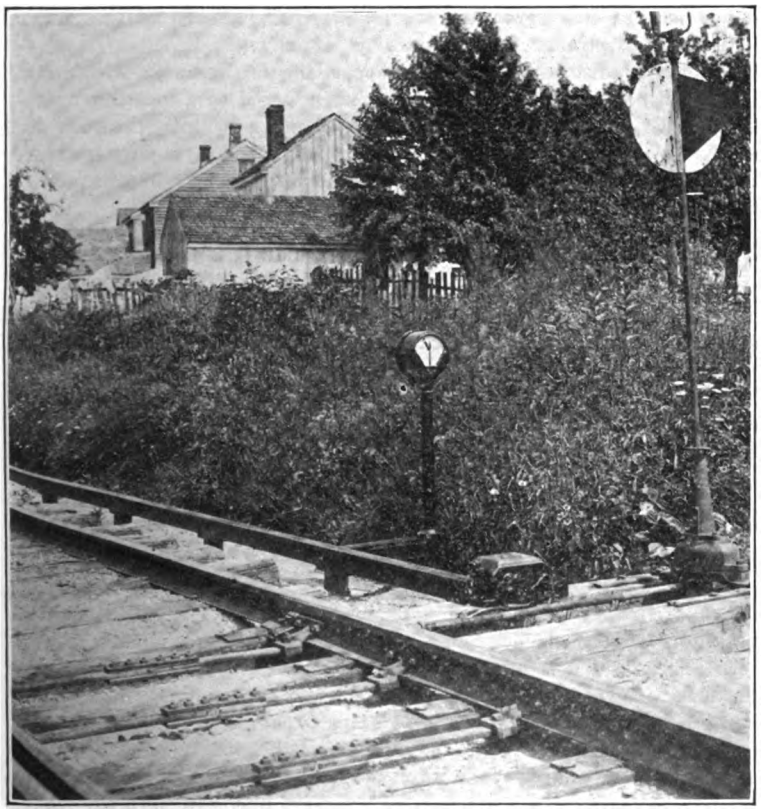

FIG. 9. SHOWING SWITCH INDICATOR, SWITCH CIRCUIT CONTROLLER AND SWITCH ROD INSULATIONS ON WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY.

Under this operation, an east-bound car entering the block under clear Signal 115 places this signal, as well as Signal 102 and 104 at Millersville to danger. As it passes Signal 113 at clear and reaches the arrow point just *east* of this signal, it places the latter at danger.

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When the car is in the center of the block, between the two arrow points, all four signals are held at danger.

The car is protected, head and rear, until Signal 102 is passed, when the block may again be entered at either end. In this operation west-bound Signal 104 will clear when the car passes the arrow point just west of this signal, but this is immaterial as Signal 102 is still providing head-on protection. Similarly, Signal 113 is clear when the car is between this signal and the arrow point just east of the same, but the car is protected in the rear by Signal 115.

The great advantage of this scheme is the facility with which car meets can be made, as opposing cars can proceed to a meeting point, such as Gambrills, without delaying each other or being subject to special rules as in systems having preliminaries. This is true because *each block is a unit* and a car in one block does not affect the movements of a car approaching an *adjoining* block.

The light signals act as a check should two approaching cars pass opposing semaphore signals at the same time: for example, should an east-bound car pass Signal 115 at the same time that a west-bound car passes Signal 102, both would be stopped by Signals 113 and 104 respectively, and one must back out of the block so that the other may proceed.

Another advantage is the allowable close headway for following cars due to the elimination of the preliminary, which is secured without complication of apparatus. Under a preliminary system, following cars in one direction are spaced the block distance plus the preliminary, which in such a case becomes an overlap, and as there may be passenger stops in a preliminary the delay to a following car may be extended.

This scheme is also flexible as regards special conditions, two of which are shown in this signaling. One is the addition of switch indicators at Crownsville and Camp Parole, the sidings being about 1000 feet long and located on curves. Each indicator is controlled by the block in which the switch is located and a preliminary extending beyond the west end of the block. This preliminary is installed, for example, at Camp Parole to prevent the switch being opened to let a car out of the siding while an east-bound car is approaching Signal 17, and, therefore, the latter car, on the main line, will have the right to enter the block.

By the use of Signal 15 no preliminary is required for this indicator at the east end of the block, for should a west-bound car pass Signal 06 as the switch is thrown, the car in the siding would be stopped by the west-bound car having placed Signal 15 to danger.

The other special situation is the regular meeting point and passenger stop at Best Gate Siding. Here it will be noted that Signals 18 and 27 are controlled by the track section between Signals 18, 26 and 27, and Signals 47 and 28 by the sections between Signals 47, 28 and

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27, whereas the track section on the siding controls Signal *26* only. If a *west-bound* car reaches the siding first and runs past Signal *26*, Signal *27* is clear for an east-bound car, and when the latter passes Signal *27* the west-bound car may proceed promptly under Signal *28*. Should the *east-bound* car arrive first it will be held at Signal *27* until the west-bound car passes Signal *26*. The passenger stop is located at Signal *27* and the east-bound car discharges passengers *east* of the signal, if the westbound car is ready to proceed, but if the westbound car has not arrived the passengers are discharged *west* of the signal.

Signal *26* was provided to allow a west-bound car to pass Signal *18* and still protect a car standing on the Best Gate siding.

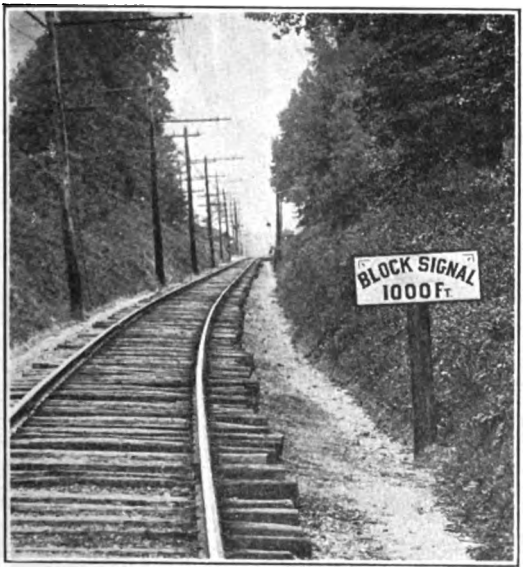

FIG. 10. SHOWING DISTANT MARKER BOARD ON WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY.

The previously mentioned shuttle service between Annapolis and Camp Parole is protected by Signals *06* and *17* as the car does not proceed west of Signal *17* and is, therefore, protected by the two signals mentioned. This signal displaced a hand operated light signal arrangement between Camp Parole and Annapolis.

The signals at the sidings are located at the fouling point instead of at the switch point, in order to better protect movements into the sidings and also cause minimum delay to cars approaching the switch.

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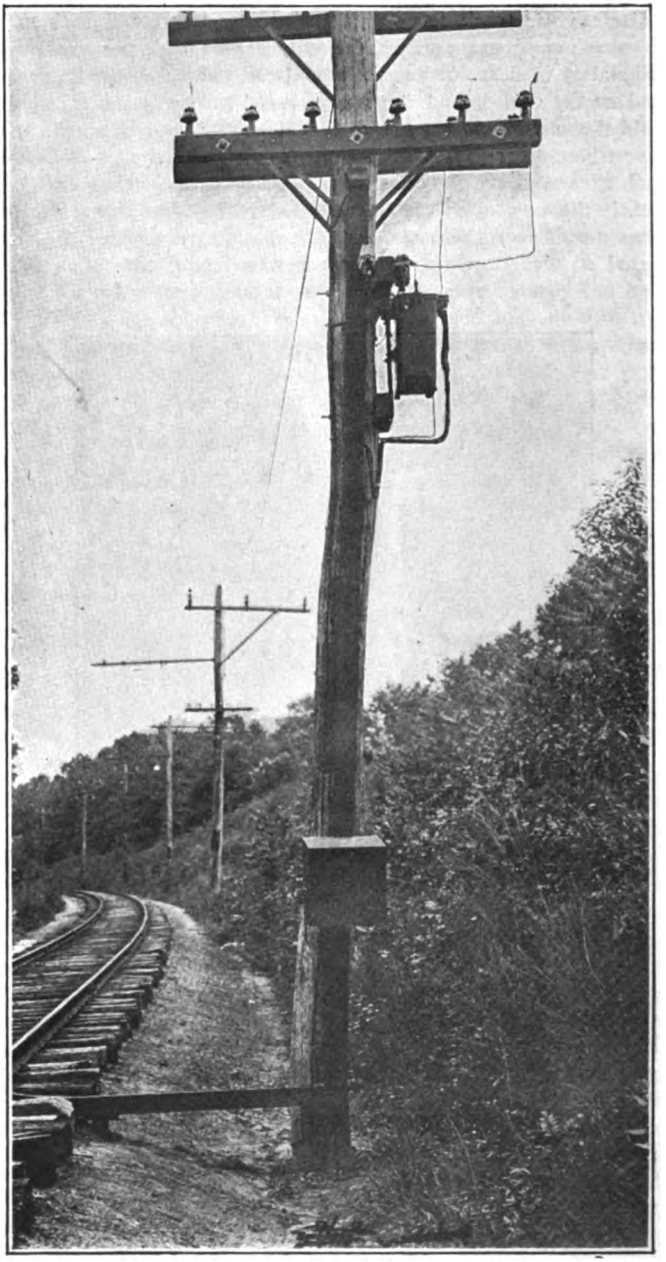

FIG. 11. SHOWING TRANSFORMER LOCATION ON WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY.

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For example:— Movements in or out of the switch at Gambrills do not effect the signals of the Cambrills-Millersville block, and also do not prevent a west-bound car proceeding safely to Signal 116, which will be at danger if the switch is open or if a car is fouling the main track. This switch will, of course, control Signals 137 and 135 as well as 116. If the signals were located at the switch point, an eastbound car taking the siding would necessarily hold Signal 102 at danger.

On this road cars head-in and back-out of sidings except when prevented by special conditions.

At present there are no distant signals but marker boards stating "Block Signal 1000 Feet" are used instead.

Power for this installation is taken from a substation located at Naval Academy Junction where available 370 volts, 25 cycle current is transformed to 2200 volts for distribution over the signaled territory. A separate one panel switchboard with ammeter and switches is included in the substation equipment. Transformers are located in the center of each block and tapped to the 2200 volt line, supply current through one secondary at 10 volts for the track circuits and through another secondary at 110 volts for the signal circuits. Each light is controlled directly by a 110 volt vane type relay which in turn is controlled by the galvanometer type track relays.

The light signals are of the 5 in. lens type previously mentioned, one lens being green with its lamp controlled by the front contact of the line relay and the other lens of red having its

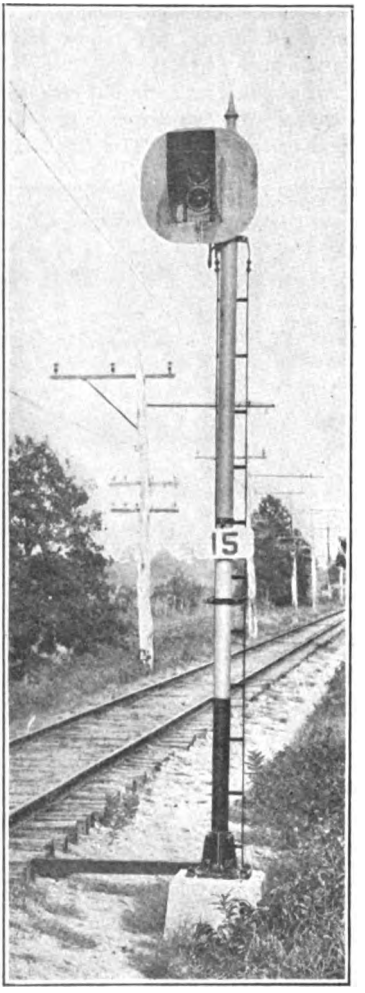

FIG. 12. SHOWING LIGHT SIGNAL WITH 5 IN. LENSES ON WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY.

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lamps controlled by the back contact of the same relay. The semaphore signals are controlled directly by contacts on the track relays and also by contacts on the light signal line relay, without the use of extra line relays.

The semaphore signals are electrically lighted, two position 0 to 60 deg., upper left-hand quadrant, Style-B, bottom post mechanism, as described in the 1911 report relating to the Illinois Traction System signaling.

Adjoining track circuits are separated by impedance bonds having a capacity of 500 amperes per rail and all insulated rail joints are of the Keystone type. The track circuits are carried into the sidings to

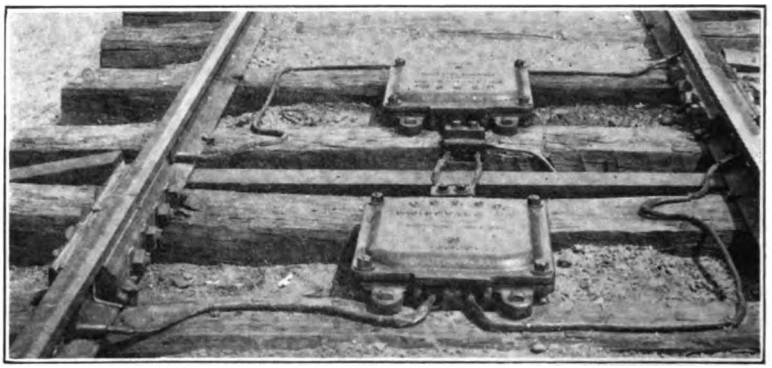

FIG. 13. SHOWING IMPEDANCE BONDS ON WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILWAY.

the fouling or clearance points of same. Circuit controllers are placed on all switches except at Best Gate Siding where cars trail through the points. All circuits are fused and provided with lightning arresters connected to a deep ground. An existing ground wire protecting the propulsion feed and high tension wires is grounded to the rails by connection to the neutral of the impedance bonds located at each siding. The relays and low tension lightning arresters are located in wooden boxes mounted on the trolley poles or on separate iron posts.

Figs. 7 to 14 inclusive represent signals and other signal apparatus as installed on this road.

SCRANTON AND BINGHAMTON TRACTION CO.

One block, .08 miles long, with four signals, was installed on this road to protect very bad curves and grades, the signaling scheme and apparatus being the same as that installed on the Washington, Baltimore & Annapolis Electric Railway previously described, and is not, therefore, diagramed or further explained.

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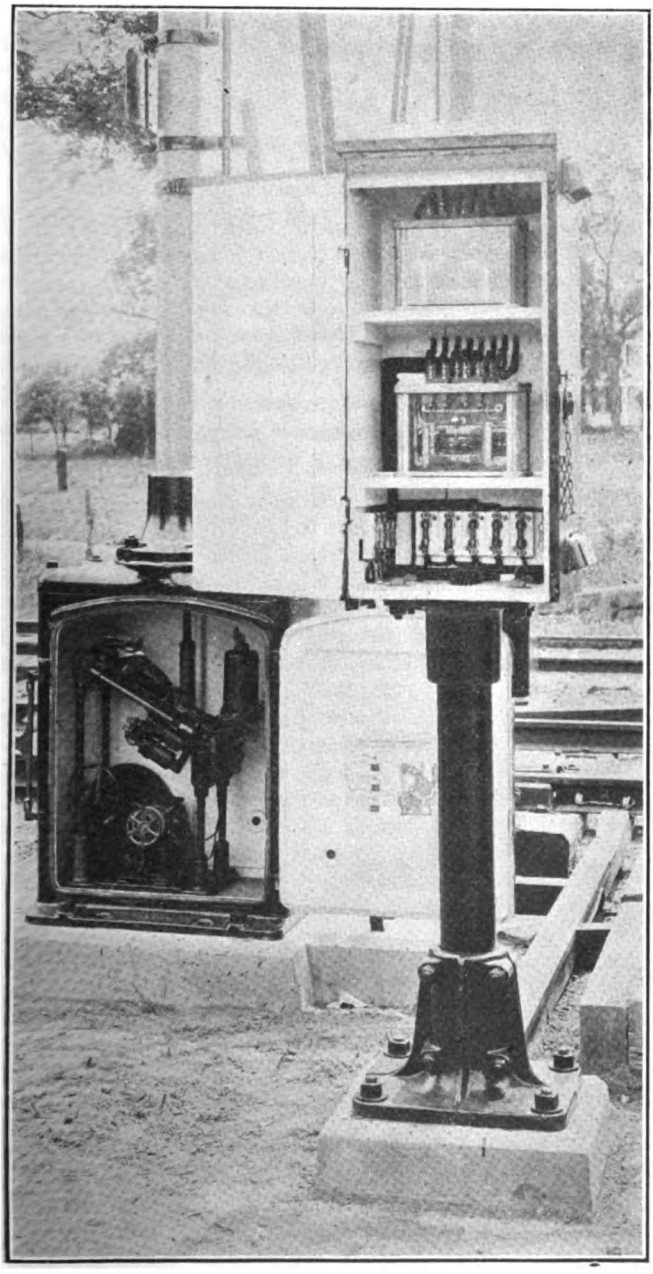

FIG. 14. SHOWING TRAIN RELAYS, RELAY SHELTER AND SEMAPHORE OPERATING MECHANISM ON WASHINGTON, BALTIMORE AND ANNAPOLIS ELECTRIC RAILWAY.

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NORTHWESTERN PACIFIC RAILROAD

(San Rafael to Ignacio, Cal. and San Rafael to Fairfax, Cal.)

These two installations protect 11.4 miles of track with 36 semaphore signals, the territory being divided into 16 single-track and 4 double-track blocks. The traffic is passenger and freight trains and a portion of the line is a combination of narrow and standard gauge with one common running rail.

This signaling is an extension of the installation made on the North Shore R. R. in 1903, by the Union Switch & Signal Co., which was the first a. c. track circuit system ever installed.

The signals are two-position, 0 to 60 deg., lower right-hand quadrant, operated by Style-B bottom post mechanism. Fig. 6 shows a general layout of the signaling with the controlling limits of each signal.

ILLINOIS TRACTION SYSTEM

(McKinley Bridge, St. Louis, Mo.)

The Illinois Traction System has erected across the Mississippi River at St. Louis what is probably the largest bridge for electric traction service in the world. A signal system is now being installed to protect 2.3 miles of track with two home signals and four home and distant signals. The bridge is double tracked to handle the heavy city and interurban business and three blocks are provided for each track, this blocking covering the bridge proper and its approaches, a distance of 1.2 miles.

At the entrance to each signaled track is located a two-arm home and distant semaphore signal, each arm the Illinois Traction System standard, two-position, 0 to 60 deg., operating in the upper left-hand quadrant. The home arm governs the first block and the distant is the repeater of the next block in advance. The next or second block on each track is a home and distant, each signal being of the 8-in. lens type. This was adopted because of the physical impossibility of securing a view of a two-arm semaphore within the clearance between cars and overhead bridge girders.

At the entrance to the third or last block, a single home light signal of the same type is installed, which governs to the end of the signaled track. The arrangement of the signaling is the same for both tracks.

The signaling was installed not only to protect following movements but to protect switches located on the east approach leading into the Venice power house and on the west approach leading into industries and a large freight yard.

To protect traffic due to these switches. switch indicators have been installed at all switches. Another special feature is the installation of a warning bell at a dangerous wagon road crossing, this bell being controlled by the signaling track circuits.

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In addition to this McKinley bridge signaling, the Illinois Traction System has installed this year previous to July 1, six miles of track circuit block signaling divided into five blocks and employing 16 semaphore signals, ten of which are home signals and six are distant signals.

These installations are similar in every respect to those installed by this company on 80 miles of track during the year 1911.

Installations by the General Railway Signal Company

Oregon Electric Railway

(Portland to Garden Home.)

On June 29, 1912, this company placed in service on the above named railway between the points mentioned, an a. c. automatic block signal system covering approximately 6.5 miles of single track and including a number of stub end and passing sidings. Twenty-two three-position upper quadrant semaphore signals are employed operating in the left-hand quadrant. The control of the signals is absolute, intermediates being used to permit following moves closer than the distance between passing points. At all passing sidings, four signals are employed. The semaphores are operated by Model 2-A direct connected mechanisms equipped with series type commutating motors as shown in Fig. 15.

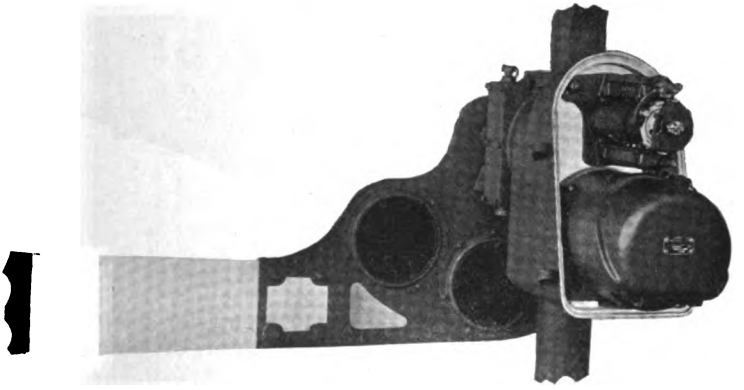

Fig. 15 — 2-A Signal Mechanism.

The control of the signals is by means of a polarized line through the medium of three-position relays. Continuous track circuits for the control of all signals are employed, both rails being retained for the return of the propulsion current. The track relays are the General Railway Signal Company's Model-2, Form-A Universal type,

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similar to that shown in Fig. 16. The three-position line relays above mentioned are also of this same type. The arrangement of the signals is shown in Fig. 17, page 31.

AURORA, ELGIN & CHICAGO RAILROAD

(Bellwood Avenue.)

This company has installed on the Aurora, Elgin & Chicago R. R. two three-position upper quadrant signals operating in the upper left hand quadrant, arranged to govern a crossover from one track to the other.

The installation includes several switch indicators, switch circuit controllers, etc., in order to make the protection complete. Reactance

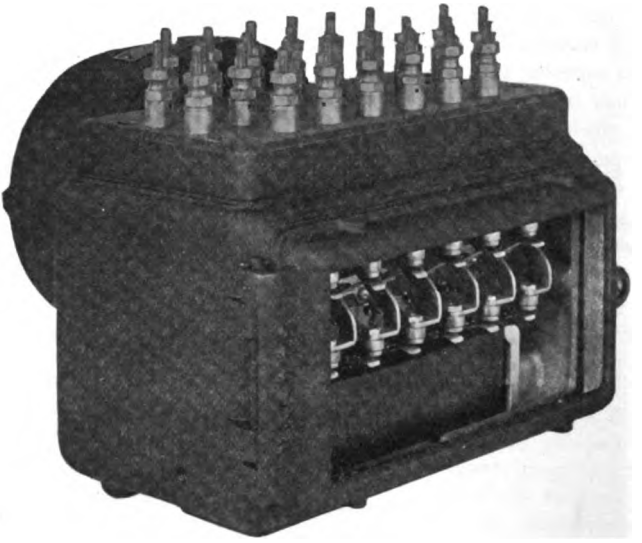

FIG. 16 — UNIVERSAL POLYPHASE RELAY.

bonds are used to provide a double rail return for the propulsion current, the control of the signals being by means of the continuous track circuit.

The track relays are our Model-2 Form-A Universal type above described. The signal mechanisms are of the General Railway Signal Company's Model 2-A direct connected type, equipped with single phase commutating type series motors operated directly over the line without the intervention of line relays. The signals are the same as those shown above in Fig. 15.

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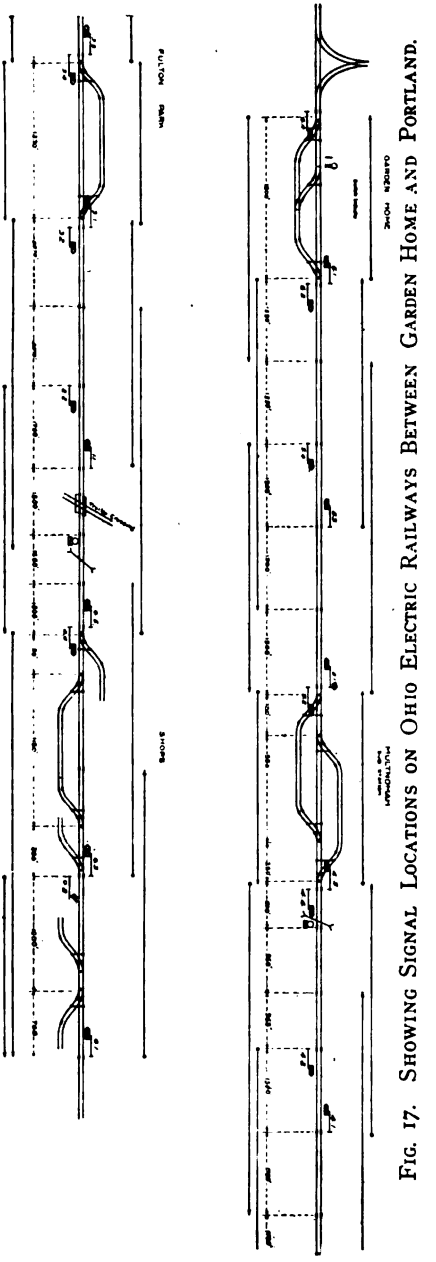

FIG. 17. SHOWING SIGNAL LOCATIONS ON OHIO ELECTRIC RAILWAYS BETWEEN GARDEN HOME AND PORTLAND.

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FIG. 18. MODEL 2-A SIGNALS ON OREGON ELECTRIC RAILROAD.

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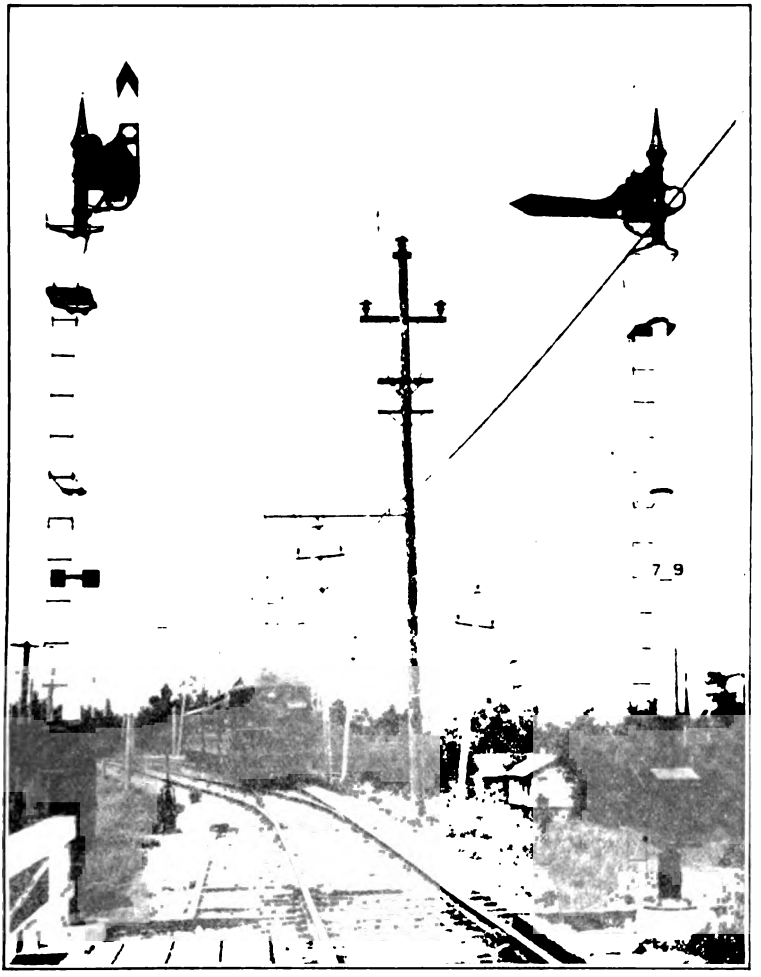

FIG. 19. SHOWING MODEL 2-A SIGNALS ON OREGON ELECTRIC RAILROAD.

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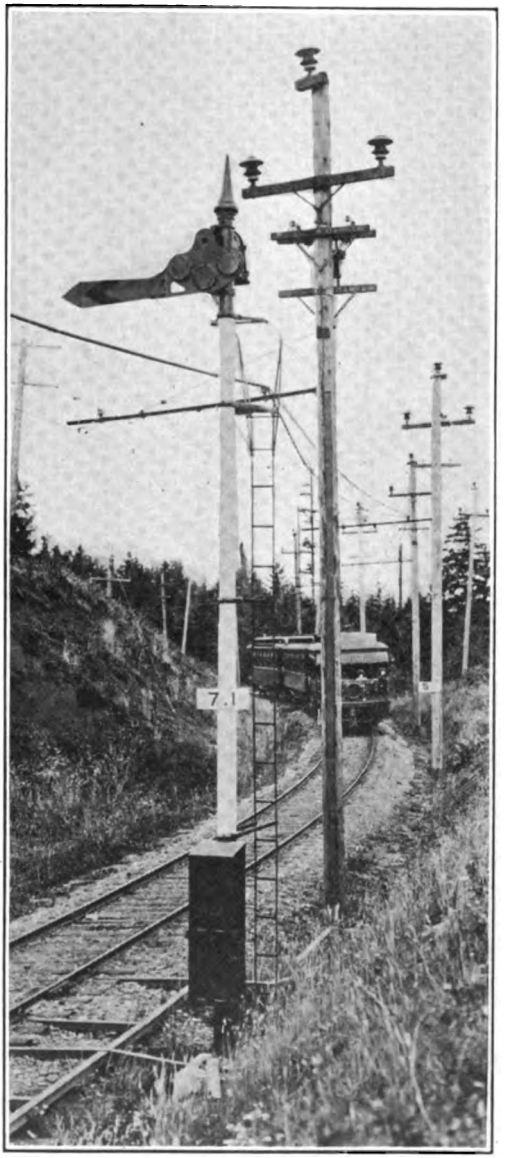

FIG. 20. MODEL 2-A SIGNALS ON OREGON ELECTRIC RAILWAY.

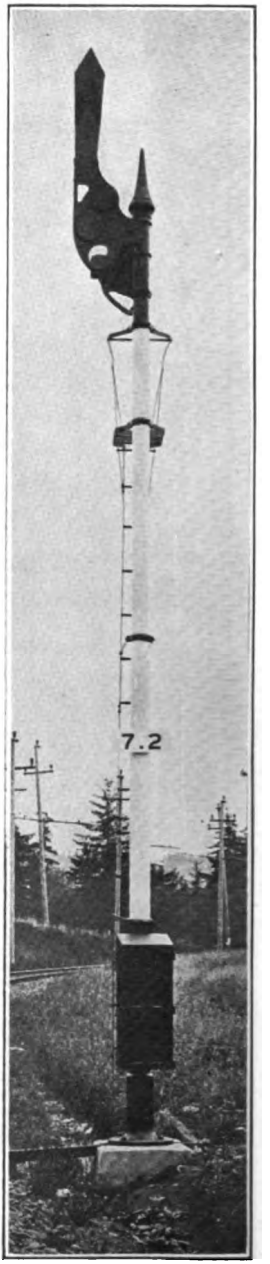

FIG. 21. SHOWING MODEL 2-A SIGNALS ON OREGON ELECTRIC RAILROAD.

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FT. DODGE, DES MOINES & SOUTHERN RAILWAY

(Boone to Ft. Dodge.)

This company has installed on the above named railway 22 light signals governing about 18 miles of single track including eight blocks. At three of the passing points four signals are used — two inbound and two outbound. The signals are absolute. A unique feature in connection with this installation is the use of but one line wire for the control of opposing signals, the return being over the rails. Line relays immune to the effects of direct current are employed to avoid interference with such direct current as may be shunted over the line from the rails. Both the line and track relays are our Model-2 Form-A Universal type as shown above in Fig. 16. The control of the signals is by means of the continuous track circuit, both rails being retained for the propulsion current return.

Reactance bonds are of the type shown in Fig. 22. These bonds are the same as those which we have formerly been supplying except that

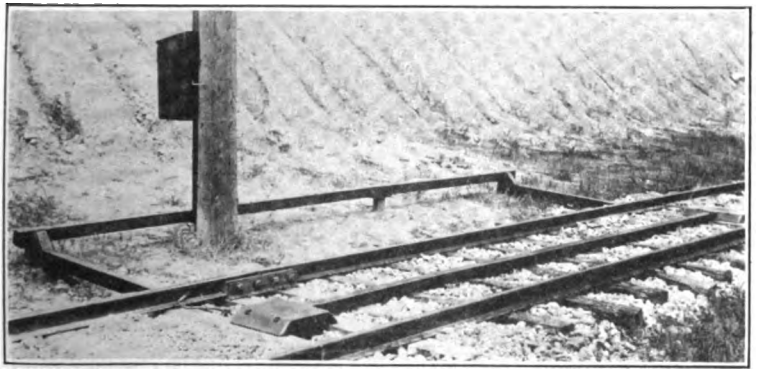

FIG. 22. SHOWING REACTANCE BONDS ON FT. DODGE, DES MOINES & SOUTHERN RAILROAD.

the covers are arranged with sloping sides to prevent dragging parts from catching and are provided with a receptacle into which trunking, for the common connection between the bonds, can enter. The leads are brought out to the sides in a convenient manner for connection to the rails.

UNION TRACTION COMPANY OF INDIANA

(Anderson Division, Siding 13 to 22 inclusive.)

On the lines of this company an a. c. automatic block signal system covering approximately 18 miles of single track, including 9 blocks, 18 home and 6 distant signals has been installed. The General Railway Signal Company's absolute permissive block signal system is

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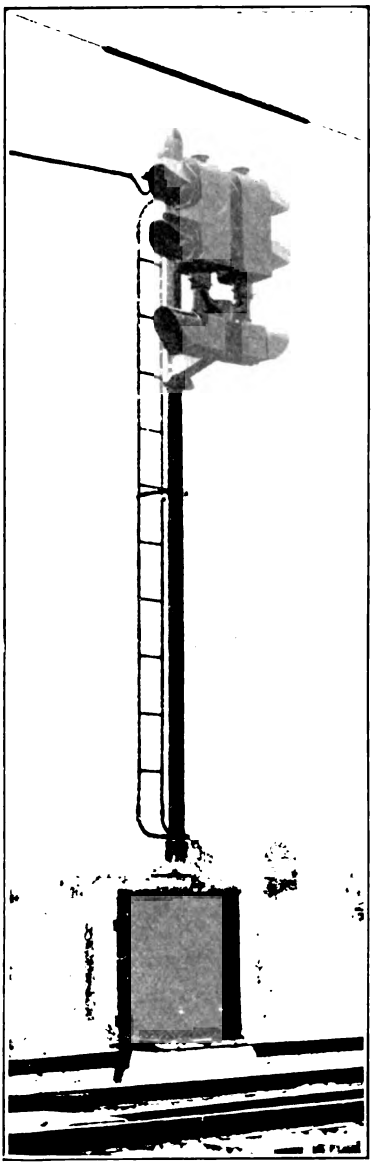

FIG. 23. SHOWING DOUBLE LIGHT SIGNAL WITH PERMISSIVE ATTACHMENTS INSTALLED IN PLACE.

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employed providing absolute blacking for opposing movements but allowing one train to follow another into the same block under a permissive signal.

The general construction and arrangement of the signals is as shown in Fig. 23. The two upper lights constitute the main signal, the lower

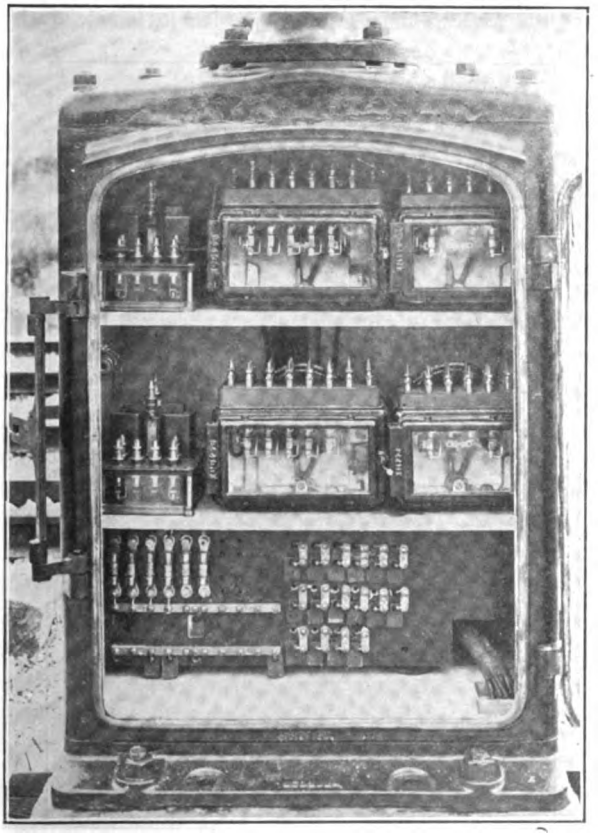

FIG. 24. SHOWING RELAY HOUSING AT BASE OF SIGNAL MAST WITH RELAYS IN PLACE, TERMINAL BOARD, FUSES, ETC.

of the three lights being the permissive signal. A sheet iron relay housing is installed at the base as shown in Fig. 24, in which is located all the relays, fuses and other apparatus required at a location. Reactance bonds as shown in Fig. 22, and as described above in connection with the Ft. Dodge system, were employed. All track and

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line relays are of the General Railway Signal Company's Model-2 Form-A Universal type as shown in Fig. 16.

A unique feature of the system consists in the use of but two line wires for the control of opposing signals, both the absolute and permissive indications being given over these same two wires, the circuit being so designed that the permissive indication having been given, neither of the proceed signals into said piece of single track can be

FIG. 25. BLOCK INDICATOR IN PLACE.

given until the permissive light has been extinguished. All of the sidings are double ended, the signals being located on the same mast at the center point of the sidings. In view of this arrangement it will of course be impossible for a man at the switch to see both of the signals. For this and other reasons indicators are employed at the switches to serve as repeaters for the signals which cannot be seen and

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also to indicate the condition of the block governed by the normal danger signal. In certain cases, time element attachments are used in connection with the indicators to prevent a movement from the siding simultaneously with a train entering the block at the other end. All indicators are normally clear provided the block is unoccupied. The time element indicators are interconnected with the system in such manner that when a switch has been thrown they will go to stop and not clear until after a predetermined time has elapsed, provided the block has not been entered by a train in the meantime. The time element indicator, therefore, serves practically the same purpose as a preliminary track circuit, doing so at a greatly reduced cost. Distant signals are employed wherever a clear view of the home signal cannot be obtained a sufficient distance away to avoid slowing down. All distant signals are controlled by track circuits which will cause them to assume the stop position with a train between the distant and home signal.

The control of the signals is by means of the continuous track circuit, both rails being retained for the return of the propulsion current throughout the entire signaled territory.

Block indicators as shown by Fig. 25 are used at the commencement of all preliminaries to prevent a train approaching the meeting point interfering with an opposing train which may be late. The control is such that the indicator is lighted if the opposing block is occupied, thereby indicating to the motorman that he may proceed to the siding without interfering with the opposing train.

TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION CO.

(Duffs to Junction. Brazil and Terre Haute Division.)

This company has installed on the above named railroad between the points named and a. c. automatic block signal system governing approximately 15 miles of single track including six blocks and twelve signals. Fig. 26 shows a switch indicator with back cover removed, showing time element attachment, indicator movements, etc., as well as switch box and mechanical connection between switch indicator and switch points. Fig. 27 shows the front view of this same switch indicator, enclosed.

Fig. 28 shows a complete installation at a stub-end siding, with switch box, switch indicator, reactance bonds, signal pole, etc.

The arrangement and control of the signals and other details is the same as that employed in connection with the Union Traction Company of Indiana system described above. The only essential difference between the two systems being the use of stub end sidings on the lines of this company.

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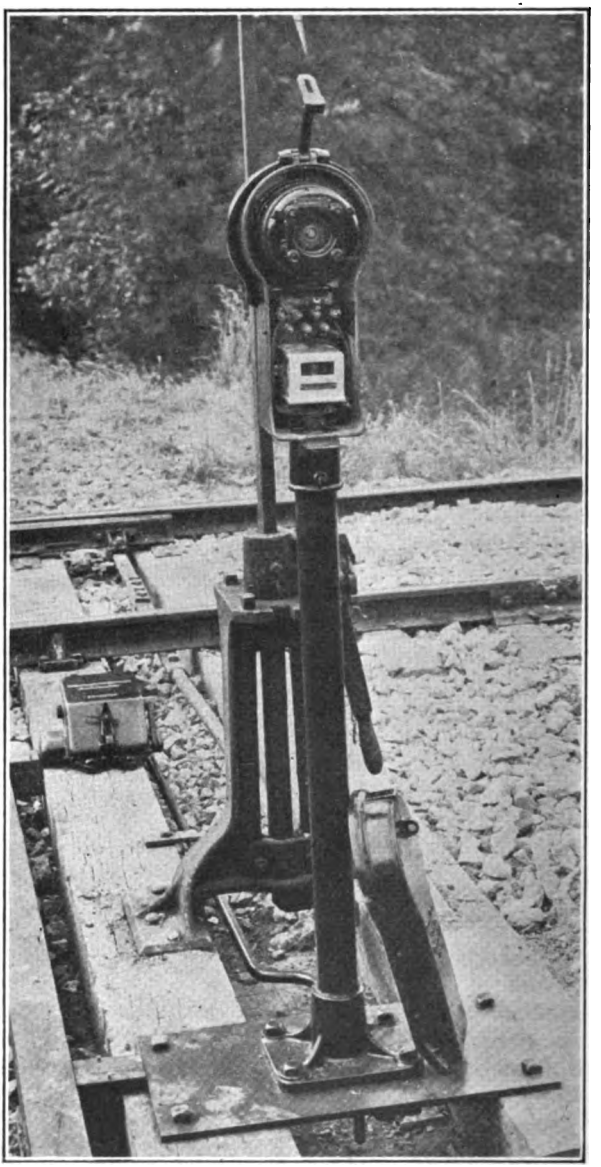

FIG. 26. SHOWING SWITCH INDICATOR WITH BACK COVER REMOVED.

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FIG. 27. SHOWING SWITCH INDICATOR ON TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION CO.

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LEHIGH VALLEY TRANSIT COMPANY

(Emaus Junction to Norristown.)

This company is installing on the above named railroad an a. c. automatic block signal system covering approximately 41 miles of single track including 38 signals and 18 blocks. Twelve of the passing points will be stub end sidings and six will be passing sidings. Semaphore signals operating in two positions 0 to 90 deg. in the upper left-hand quadrant will be employed. Model 2-A direct connected mechanisms equipped with 25 cycle single phase induction motors will

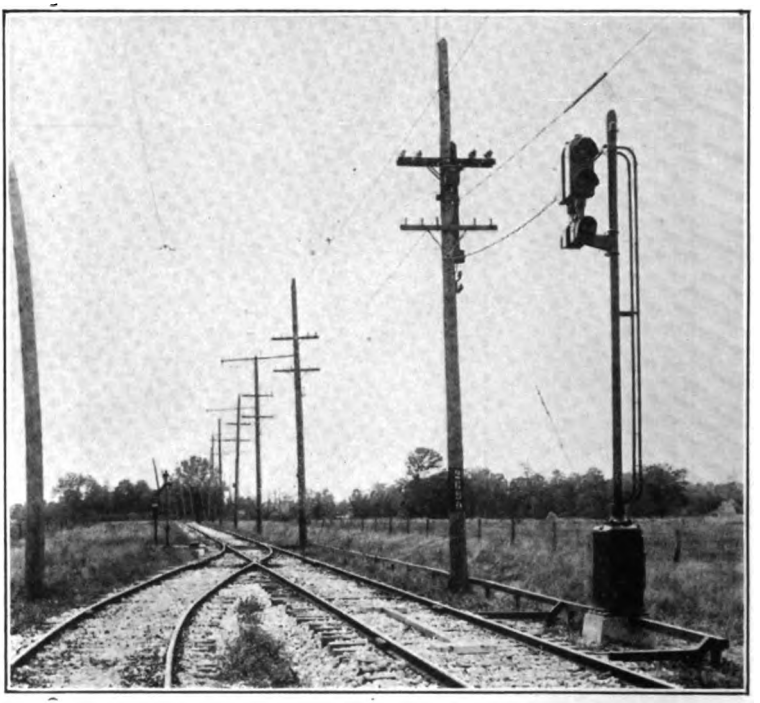

FIG. 28. SHOWING SIGNAL INSTALLATION COMPLETE AT STREET END SIDING.

be used for operation of the semaphores. The signal masts will be mounted on housings similar to that shown in connection with the light signal, Fig. 23. All the relays and other apparatus required at a location will be mounted in these housings.

Absolute signaling will be employed. All track relays will be of the G. R. S. Co.'s Model-2 Form-A Universal type (Fig. 16) and all line relays will be of the Model-2 Form-B as shown in Fig. 29. Reactance

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bonds of the type shown in Fig. 22 will be employed. The control of the signals will be by means of the continuous track circuit, both rails being retained for the return of the propulsion current. Switch indicators will be required at outlying points. In some cases indicators will be used at the sidings equipped with time element devices for the same purpose and as described in connection with the Union Traction Company of Indiana system above mentioned.

FIG. 29. MODEL-2 FORM-B LINE RELAY.

PHILADELPHIA & WESTERN RAILWAY

(Villa Nova to Norristown.)

This company has installed on the Philadelphia and Western Railway between the points above mentioned an a. c. automatic block signal system governing six miles of double track and including seven blocks

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FIG. 30. SWITCH INDICATOR WITH FRONT COVER LIFTED UP, EXPOSING BLADE AND PUSH BUTTON.

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with as many signals. The semaphores will operate, for the time being, 0 to 90 deg. in the upper quadrant. They are, however, so arranged that later on they can be operated in three positions. General Railway Signal Company's Model 2-A direct connected signal mechanisms will be employed for the operation of the semaphores and are equipped with 25 cycle single phase induction motors. The General Railway Signal Company's Universal type Model-2 Form-A relays, Fig. 16 will be employed. The line relays will be of the General Railway Signal Company's Model-2 Form-B as shown in Fig. 29. Reactance bonds of the type shown in Fig. 22, will be employed. At Villa Nova an interlocking plant will be installed for the control of the junction signals and switches at that point, the signal mechanisms, relays, etc., being the same as those used in connection with the block work. The control of the switches and signals will be by means of a mechanical interlocking machine, all signal levers being equipped with A. C. operated electric locks as a means of indicating when the signals have assumed the stop position. The signals will be controlled by a track circuit as in the case of the automatic signals.

NEW APPARATUS

Certain detail improvements in apparatus have been made as follows:

Reactance Bonds: In order to provide a bond which would make a better appearance in the roadway and also prevent the catching of any parts dragging from the rolling stock and at the same time permit of connections being made to the rails in a simple and direct manner, we have designed the arrangement shown in Fig. 22, which has been heretofore described in connection with the various systems installed by us. Another feature of this bond is that the leads between bonds and between the bonds and rails are concealed as far as possible. Aside from the external arrangement, the coils, core, etc., remain the same as before.

Relays: We have completed our line of Model-2 Form-B relays, one of which is shown in Fig. 29. These relays are essentially for use as line devices but they may also be used as track relays. They are considerably smaller than the Model-2 Form-A and therefore take up less room in the relay boxes. Their operating features are identical with the Model-2 Form-A, that is, a non-magnetic rotor is employed which makes the relay immune to direct current and responds only to alternating current. It is made in two sizes, four and six way respectively, the smaller size accommodating a maximum of four front and two back contacts, the larger size accommodating a maximum of six front and two back contacts. The relay can be made to operate in either two or three positions and when desired may be equipped with a blade and covered with an enameled sheet iron case, thus producing an indicator.

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Indicators: Our a. c. indicator remains as before, with the exception that we have designed a time interval device which mounts in the indicator as shown by Fig. 26. We have also provided a cast iron cover as shown by Fig. 27, which drops over the face of the indicator

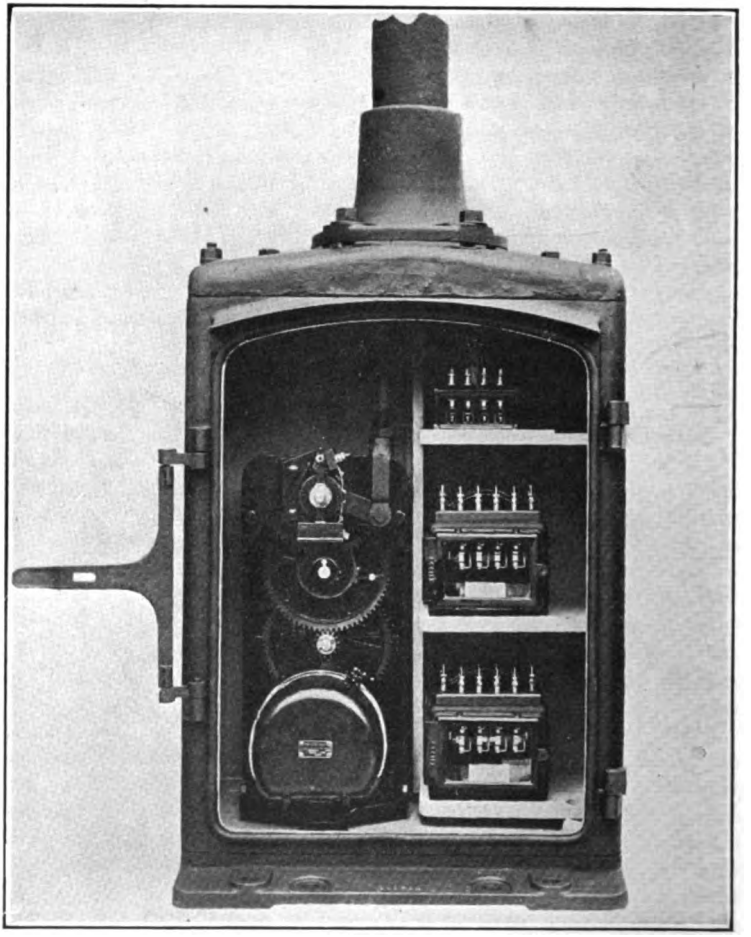

FIG. 31. SHOWING MODEL 2-A SIGNAL BASE OF MAST MECHANISM.

and which may be lifted by the trainman as shown in Fig. 30, whenever the indicator is to be observed. It is the expectation that this cover will prevent the breaking of the glass by stones being thrown and will also keep sleet and snow from preventing the blade being seen. A

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push button or key switch attachment can be added to the indicator as required. The movement may be either of the rotating non-magnetic shell type immune to the effects of direct current or of the Z-armature type, the latter being somewhat less expensive and consuming less energy. In short the indicator described and illustrated above is universal, performing all of the functions required in connection with switch indicators.

Signals: Our Universal Model 2-A Signal remains unchanged in principle. We have, however, in the past year perfected the induction motor for use in connection with this signal and are supplying a number of them in connection with recent installations. We also wish to call attention to our Base of Pole Model 2-A Signal Mechanism as shown by Fig. 31. This mechanism was exhibited at Atlantic City last

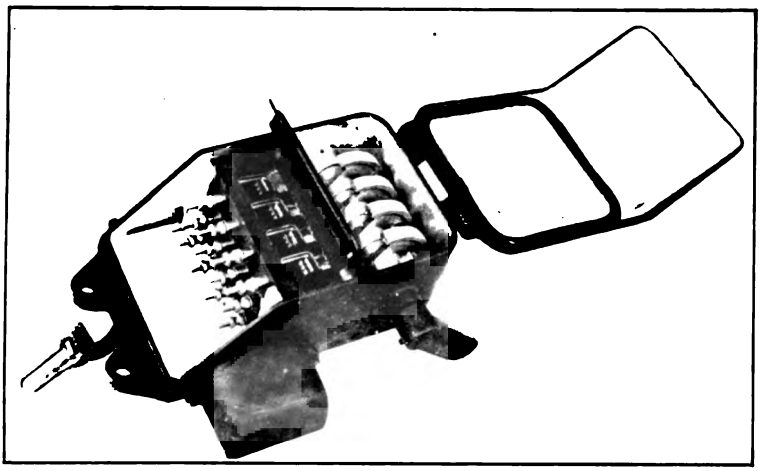

FIG. 32. SHOWING SWITCH CIRCUIT CONTROLLER.

year and it will be noted that there is room in the mechanism case for at least three relays, it being possible to add the fourth by placing the shaft above the mechanism, which can be equipped either with the commutating type or induction motor as desired.

Switch Circuit Controllers, etc.: We exhibited at Atlantic City last year our latest improved switch circuit controller as shown in Fig. 32. The features of this controller are described in our bulletin No. 123, page 23. During the past year we have made various minor improvements which have resulted in a universal box fully meeting the exacting requirements of railway business.

Block Indicators: We have developed a device which has been termed a block indicator as shown by Fig. 25 for use as described in connec-

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tion with the Union Traction Company of Indiana signal system. This device provides a very simple means of indicating to the motorman whether or not an opposing block is occupied, thus preventing him from interfering with the movements of an opposing train which may be late.

Installations by the Nachod Signal Company

This company has furnished your Committee with the following list of signals installed during the past year.

Name of Road	Nachod signals in use		Remarks
	Quantity	Type	
Altoona & Logan Valley Electric Ry. Co.	2	M	
Bridgeton & Millville Trac. Co.	2	M	
Camaguey Electric Co. (Cuba)	4	CD	
Chattanooga Ry. and Light Co.	26	C	First few of these included in 1911 report.
Chicago & Milwaukee Elec. R. R. Co.	2	C	55 miles per hour operation reported on this road.
Christchurch Tramway Board, New Zealand.	2	CD	
East St. Louis & Suburban Ry. Co.	2	CD	
Fonda, Johnstown & Gloversville R. R.	3	HD	Double track signals.
Fort Smith Light & Traction Co.	2	C	
Cie. Gen. Francaise de Tramways, Reseau de Havre.	2	C	
Hudson Valley Railway Co.	2	C	
Illinois Traction Co.	56	CD	First set of these included in 1911 report.
Knoxville Railway & Light Co.	4 1 repeater signal.	CD	
Lehigh Valley Transit Co.	22 6	CD MD	Four of these signals were on trial at the time of your 1911 report.
Lewistown & Reedsville Elec. Ry. Co.	2	CD	
Little Rock Railway & Elec. Co.	14	C	
Louisville Railway Co.	2	CD	
Mahoning & Shenango Ry. & Lt. Co.	34	C	This company has been using some of these signals since 1909. A set at Stop 12 operated 37,000 times to date for six months with no failures, no maintenance.
Nashville Interurban Railway	2	C	Protect locomotive, passenger and express traffic.
New Jersey & Pennsylvania Trac. Co.	14	MD	
New York State Railways	6	C	
Philadelphia Rapid Transit Co.	1 contactor operating U. S. & S. Co. semaphore; 5 contactors operating U. S. & S. signals for subway surface cars.		Eureka breaker mentioned in 1911 report has been replaced Dec. 1911 with Nachod non-directional contactor.
Parkersburg, Marietta & Interurban Ry. Co.	20	MD	
Roanoke Ry. & Elec. Co.	19	M	
Scranton Railway Co.	17	M	
Sheffield Co. (The)	2	C	
Southwest Missouri R. R. Co.	3	HD	Double track curve protection.

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INSTALLATIONS BY THE NACHOD SIGNAL COMPANY—(*Continued*).

NAME OF ROAD	Nachod signals in use		Remarks
	Quantity	Type	
Spokane & Inland Empire R. R. Co....	2	C	
Springfield (Mo.) Traction Co.....	2	CD	
St. Joseph & Savannah Interurban Ry..	18	CD	Interurban, single end sidings.
Tri-State Railway & Elec. Co.....	8	CD	Two of these signals included in report of Ohio Valley Elec. Co. for 1911.
Valley Traction Co.....	2	CD	This company conducting very careful test since Nov. 1911.
Virginia Ry. and Power Co.....	8 trolley contactors.		Used in connection with card schedule record.
Wheeling Traction Co.....	38	C	Referring to page 15 of your 1911 report, regarding the Wheeling Trac. Co. the test mentioned resulted in the equipping of their lines with 38 Nachod signals.
Wilkes-Barre Railway Co.....	22	MD	

DESCRIPTION OF THE NACHOD SIGNAL FOR ELECTRIC RAILWAYS

In the design of signals operated by intermittent contact devices, proper attention has not always been directed to the manner of failure of the signals. The system herewith described will not only permit of flexible car operation, but, in the event of disarrangements of the circuits or apparatus, will also indicate stop signals, or at least not permit proceed signals to be given. With the mechanical contactor it is believed that no clear failure* can be produced by any of the following conditions:

(1) The breaking of any line wire;
(2) the crossing of any line wires;
(3) the grounding of any line wires;
(4) the open circuiting of any operating coil;
(5) the short circuiting of any operating coil;
(6) the sticking of any armature.

The disk type signal reinforced with brilliant light indications has been used instead of the more expensive semaphore. The indications are enclosed in a weather-proof case, and are therefore protected from adverse weather effects and corrosion of bearings, etc., due to moisture. On account of this, the excessive torque which must be otherwise provided for an occasional accumulation of snow and ice is not required in this type. Fig. 33 shows the signal mounted on a universal bracket. The indications are visible 800 to 1,200 ft. in ordinary weather.

* This excepts failures at the contactor which are arranged to be plainly visible to the motorman by placing the contactor 200 or 300 feet in advance of the signal.

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The Nachod automatic signal, known as Type MD and described herewith, is a disk type signal actuated by the power in the trolley line and controlled by trolley contact devices. Four line wires are required. For opposing movements on single track the signals are normally neutral; but when a stop signal has been set at the far end by a car leaving a siding to enter the block, a permissive signal will be shown to the car as evidence of that fact. The permissive signal is interlocked with the stop signal so that it cannot be displayed unless the latter is showing. Fig. 35 shows the line wiring diagram for a set of signals.

FIG. 33. SIGNAL BOX ON BRACKETT, PERMISSIVE INDICATION.

The operation of the system is briefly as follows: A car or train entering under the left-hand contactor will change the signal from neutral or normal, no lights and no disks — the condition of indication with no car on the block limits as defined by the contactors — to a permissive signal, a white disk and a white light. This is an indication that the stop signal, a red light and a red disk, is showing at the right-hand end of the block. When the car passes under the contactor at the right, both signals will be restored to normal. Should, however, a second car follow into the block, the motorman will see not a neutral signal, but the permissive signal. As he runs under the contactor there will be a blink of the light and a dropping of the white disk to indicate that his car has operated the relay counter. When the first car goes out of the block at the right end the signals are not changed,

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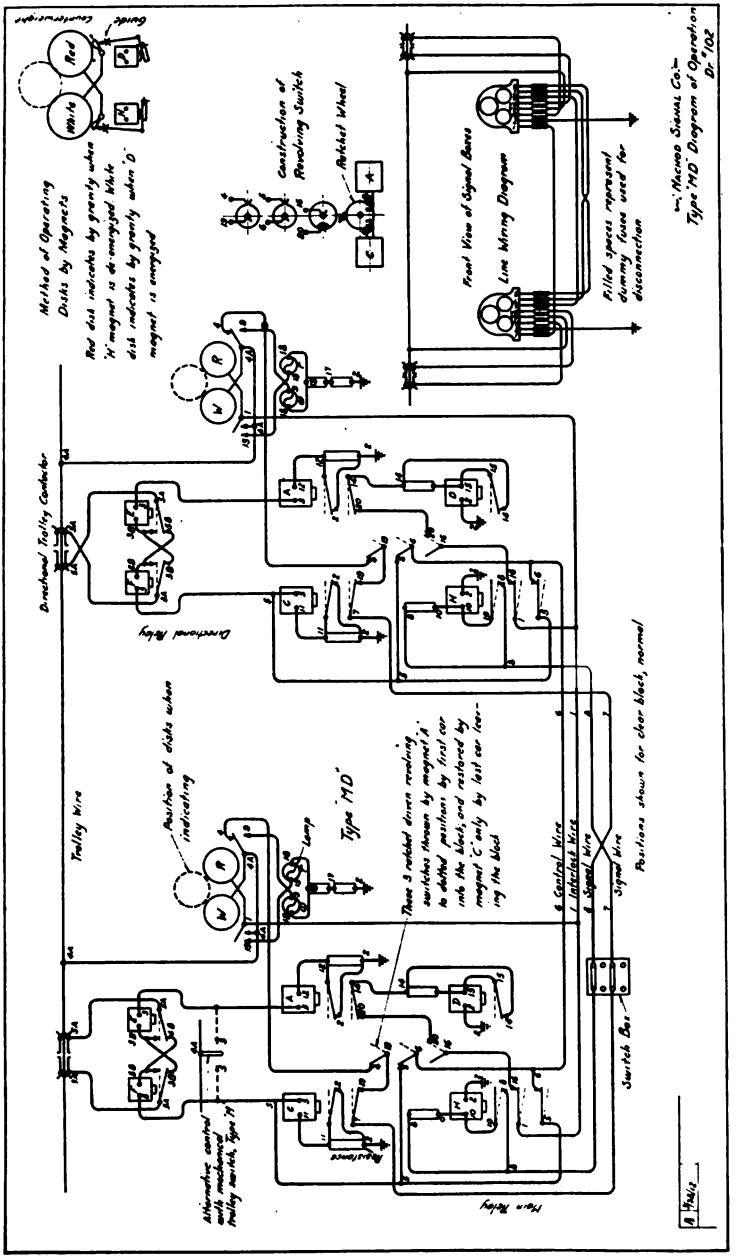
Method of Operating Disks by Magnets
Red disk indicates by gravity when 'H' magnet is de-energized. White disk indicates by gravity when 'D' magnet is energized
Construction of Revolving Switch
Pedestal Wheel
Front View of Signal Boxes
Line Wiring Diagram
Filled spaces represent dummy fuses used for disconnection
Type 'MD' Diagram of Operation Dr. 102
Directional Trolley Contactor
Directional Relay
Trolley Wire
Position of disks when indicating
Lamp
Type 'MD'
Three 3 pointed driven revolving switches thrown by magnet 'A' to shifted position by first car into the block, and restored by magnet 'C' only by last car leaving the block
4 Control Wire
1 Indicator Wire
1 Signal Wire
2 Signal Wire
Positions shown for clear block, normal
Switch Box
Alternating control with mechanical Trolley switch, Type 'M'
Train Relay

FIG. 34. WIRING DIAGRAM FOR SIGNAL LAYOUT.

FIG. 35. LINE WIRING DIAGRAM FOR SIGNAL BOXES.

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but when the second leaves, they will be restored to normal. Should a car enter the block say from the left, setting the signals, then in backing out under the same contactor again, it will clear them. Should a car enter an occupied block against a stop signal, the signal at the other end will be set at stop also, and when the car wrongly entering the block backs out again, the signals will be restored to their previous condition as before its entrance.

Referring to Fig. 34 the electrical operation of the signal is as follows: In the normal condition of the block with signals neutral, that is, no

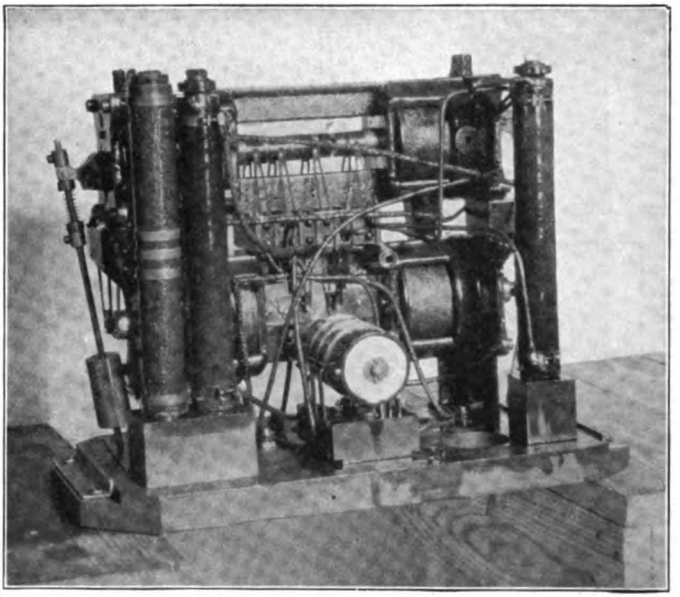

FIG. 36. REAR VIEW OF OIL-IMMERSED RELAY UNIT, INVERTED.

lights nor disks showing, the red disk R is prevented from indicating by the continuous energization of the H magnet in each relay, a separate signal wire 7 or 8, and revolving switch 19–4 being used for each stop signal. A car entering the block sends a momentary current through coil A by means of a mechanical trolley switch or by the trolley contactor and directional relay, breaking the circuit at the near relay of the H magnet in the far relay. The far signal therefore goes to the stop indication by gravity, showing a red disk and red light, and when it has done so, closes a circuit through the interlock wire 1, and the magnet D, which exhibits the white disk and white light as a proof that the red disk is showing. The lamps are operated

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by the disks in such a manner that when the disk comes to an indicating position the circuit of the corresponding lamp behind a semaphore lens is closed.

The arrangement of clearing the signals or restoring them to the normal neutral position by means of No. 6 control wire and magnet C, after they have been set as described, is general; and a car or cars in the block may leave by either end singly or in any combination, the signals showing neutral only when all the cars that have entered the block have left it. Moreover, since the circuits for displaying stop signals are in duplicate and independent, it is evident that cars may reach opposite ends of the block at the same or successive instants with precisely the same ultimate effect on the signal. Also the clearing arrangement is such that when a car enters the block against the stop signal, thereby setting a stop signal at the opposing end, on backing out it will restore the signals to the same condition as before its entrance.

This results in the following desirable and highly universal operation: Should a car enter a block, having set signals, and remain there, then cars entering and backing at either end — whether against the permissive signal or the stop signal — will not change the stop signal as set by the first car in the block. After all the cars have left except the first one, when that one leaves the block the signals will be restored to normal.

The relay unit as shown in Fig. 36 is an assemblage of four magnets and three resistance units mounted on a terminal board and connected to the outside wiring by spring contacts. The upper pair of magnets move the revolving switch through a ratchet and pawl mechanism and serve to count the cars in the block. The lower pair drive the color disks. All the magnets operate switches in addition. The relay is bolted to the cast-iron upper case containing the signal indications and hangs in a tank of transformer oil. The entire unit is always lubricated, protected against corrosion and cushioned from violent magnet blows by the oil. It is oil cooled, oil insulated, and the switches are oil break.

With these general remarks the circuits will be described in further detail:

The term front contact is used to denote a contact made by an armature when its operating coil is energized, as, for instance, the front contact 1–16 operated by coil H. A back contact is one in which the contact is made when the armature falls away, the coil being de-energized, as 10–8. Also an indicating contact or switch is one closed by the color disk in its indicating position as 4A–10 on the white disk, a non-indicating contact being one closed when the disk does not show as 4A–4.

The direction of cars may affect the signals appropriately by causing them to energize magnet C or A, respectively; and this selection

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FIG. 37. TROLLEY CONTACTOR, SIDE VIEW.

may be made either mechanically, by a trolley switch in which a lever is struck by the trolley wheel itself, its movement making one or the other of two electrical contacts, or by an electric selector, comprising the directional trolley contactor shown, without moving parts, and acting in conjunction with a directional relay having coils E and F. As this directional relay form a separate unit, and could be applied in other situations than here shown, it will be described separately.

The directional trolley contactor, Fig. 37, consists of two longitudinal sections or halves, each consisting of a pair of strips insulated from the trolley wire, but supported near it so that a metallic trolley wheel riding on the wire will connect the strips with the wire by means of its flange. The two halves of the contactor at the insulation are placed so closely together that for an instant the trolley wheel bridges both halves. The wheel does not leave the wire, but touches one or both of the flared and inclined contact strips, which, in order to prevent blows at high speed and to maintain a continuous contact, are flexible in themselves and flexibly mounted. The attachment of the contactor to the wire is by standard ears and suspension; and the insulation is through impregnated hickory. It operates the signals at speeds of 55 miles per hour. When a car passes in such a direction that the wheel reaches the end (see Fig. 34 and 35) 3A first, a circuit is formed from the trolley wire 4A, strip 3A, back contact 3B, terminal 3B, terminal 3 of coil E to the operating coil A, thence to ground. During this period the armature of coil E is attracted, changing the connection of 5A from 5B to 3B. Then when the car reaches the second half of the contactor 5A, the current continues from trolley wire 4A, wire 5A, front contact 3B, through the same coil E and to operating coil A as before. It will be noted that no current is broken at the back contact 5B, the only requirement being that E must attract its armature before the car reaches the end 5A of the contactor. Since these connections are exactly symmetrical for coil F, it follows that a car running under the contactor so as to touch 5A first will thus energize operating coil C; and

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by attracting the armature of F will continue to energize that coil when the wheel reaches the second strip 3A.

All letters and numbers referring to the right-hand signal are distinguished by a prime letter or numeral, as 2′, in the following description:

When the signals are neutral there is a circuit from the trolley wire 4A, non-indicating switch 4A-4, revolving switch 4-19, back contact 19–7, through a switch box, if one is used, to signal wire 7, entering the other signal relay as 8′, resistance 8′–10′, through coil H′, by terminals 10′, 2′, to ground 2′. By use of a switch box a track switch not having its points completely closed will set stop signals at both stations.

A car entering the block from the left closes the local circuit from trolley 4A through coil A, as described, terminal 12, back contact 2, ground 2. The armature of coil A rotates the revolving switch one notch, throwing it into the dotted position, and breaking the aforementioned circuit through the H′ magnet at the revolving switch 4-19. The armature of H′, being de-energized, falls, and the red disk appears by gravity. When it reaches the indicating position, the indicating contact 4A′–1′ is closed; current then flows from trolley through 4A′–1′ through the interlock wire 1 to the other box, front contact 1–16, revolving switch 16–20, back contact 20–14, resistance 14–15, terminals 15, 2 of coil D, to ground 2. Coil D is thereby energized, attracting its armature and displaying the white disk W, which on indicating closes the indicating switch 4A–9, and lights the white lamp, Thus by switch 4A′–1′ the white disk is interlocked with the red, so that if the red disk should stick in the non-indicating position, the magnet D would not be energized, nor would the white disk indicate. Moreover, it will be evident that this interlocking is mutual; and if, for instance, the white disk W should stick in the indicating position irrespective of the state of coil D, or be raised by hand to that position, then the H′ magnet would be de-energized by the opening of the non-indicating switch 4A–4 and exhibit the red disk R′. Furthermore, should the H magnet fail on a clear block, either by open circuiting or short circuiting, its armature thereby dropping, the red disk in that box will be displayed, but the corresponding white disk in the other box will not be displayed, since that circuit is open at the revolving switch 16′–20′. The foregoing comprise the safety circuits.

Every impulse of current in the magnet A, as by a car passing the contactor to enter the block, rotates the revolving switch one notch in the clock-wise direction, and every impulse of current in coil C, as by a car leaving the block, rotates this switch one notch in the counter clock-wise direction. Therefore, if the signals were neutral with no car in the block, after all the cars that have entered the block have vacated it, they will again assume the neutral position. The clearing magnets C and C′, with the control wire 6 and its associated revolving

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switches 5–6 and front contacts 5–6, are used to control the restoration of the signals.

Thus a car going straight through the block from left to right will set permissive signals at the entering end, and stop signals at the leaving end. As it leaves the block at the right-hand contactor, it will, it is true, close a local circuit through coil C′, but this will have no action on the revolving switch, since there is a mechanical stop at its initial position. Current will, however, continue by wire 5′ through revolving switch 5′–6′, through control wire 6 to the left-hand signal, thence by means of front contact 6–5 to coil C. The action of this magnet is to restore the revolving switch to its original position, closing contacts 4–19, and opening the circuit of magnet D at 16–20. This magnet being de-energized, the white disk is restored to the non-indicating position, closing the non-indicating switch 4A-4. The circuit through the H′ magnet is thereby established at 4A–4 and 4–19 as described; the H′ magnet restoring the red disk R′ to the non-indicating position. The latter action extinguishes the red right.

Should, however, a car enter the block from the left and back out again under the same contactor, in backing out it will close a local circuit through coil C as described; and, although by means of wire 5, front contact 5–6, control wire 6, and revolving switch 6′–5′, current will also energize coil C′, there will be no rotation at the revolving switch here on account of the mechanical stop. Current passing through coil C will restore the revolving switch to its original position, thereby restoring the signals to neutral, as already described.

Should a car enter, say from the left, setting the signals, and a car enter from the right against the stop signal there displayed, then the revolving switches in both relays will be rotated to the dotted position, coils H and H′ will be de-energized, and stop signals will show in both stations. (When the red disk indicates at a signal, the white disk cannot be displayed there at the same time, since the display of the red opens the circuit of the D magnet at the front contact 1–16. Moreover, the red disk is in front of the white disk and would eclipse it if both were raised by hand.) When the right hand car backs out of the occupied block, it will energize coil C′ to close the revolving switch at that box only, thereby restoring the signals to the same condition as before its entrance. In energizing coil C′ there will be no circuit through the control wire 6 to magnet C in the other box, because revolving switch 6–5 is open, and front contact 6–5 will not be closed while the car is on the contactor.

The holding open of the back contact 7′–19′, which is in the circuit of the H magnet, by the presence of the car on the contactor, will prevent the closing of the above-mentioned front contact 6–5 by the H magnet.

The new type "MD" signal will be used on the Moosic Lake division of the American Railways Company's property at Scranton, Pa.

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INSTALLATION BY THE UNITED STATES ELECTRIC SIGNAL COMPANY

This company has furnished the following list of roads which purchased its signal apparatus during 1911:

Name.	Number of Signals.
Albany Southern R. R. Co.	4
American Rys. Co., (The)	2
Aurora, Elgin & Chicago R. R. Co.	2
Bay State St. Ry. Co.	20
Birmingham Ry., Light & Power Co.	4
Boston Elevated Ry. Co.	4
Charleston Cons. Ry. & Lighting Co.	4
Choctaw Ry. & Lighting Co.	12
Crossman & Sielcken (New York, N. Y.)	16
Dallas Cons. Elect. St. Ry. Co.	4
Elmira, Corning & Waverly R.R.	16
Guinle & Co (for Campanhia Linha Circular Bahia, Brazil) New York, N. Y.	12
Holyoke St. Ry. Co.	18
Hudson Valley Ry Co.	4
Illinois Traction System	2
Indianapolis Traction & Terminal Co.	4
Knoxville Ry. & Light Co.	1
Manila Elec. R. R. & Light Co. (Manila, P. I.)	12
Middlesex & Boston St. Ry. Co.	2
Milford, Attleboro & Woonsocket St. Ry. Co.	12
Nashville Ry. & Light Co.	2
Niagara, St. Catharines & Toronto Ry. Co (St. Catharines, Can.).	2
Norfolk & Portsmouth Trac. Co.	2
North Jersey Rapid Transit Co.	4
Orange County Traction Co.	24
Pan-Handle Traction Co.	12
Portland Ry., Light & Power Co.	18
Public Service Ry. Co.	399
Quebec Ry., Light & Power Co. (Quebec, Can.)	2
Rio de Janeiro Tram. Light & Power Co. (Rio de Janeiro, Brazil).	60
Rockland, Thomaston & Camden St. Ry. Co.	2
Springfield St. Ry. Co.	22
Steubenville & Wheeling Trac. Co.	1
Susquehanna Ry. Light & Power Co.	4
United Traction Co. (Albany, N. Y.)	2
Watlington & Co. (London, Eng.)	40
Westchester Electric Railroad Co.	2
Worcester Consolidated St. Ry. Co.	58

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Installation of Simmen Signal Equipment on the Indianapolis & Cincinnati Traction Co.*

In May, 1912, the Indianapolis & Cincinnati Traction Company, Charles L. Henry, president, put into service a manually operated, remotely controlled interlocking signal system designed and installed by P. J. Simmen of Northey–Plummer, Ltd., Indianapolis and Toronto. This system affords means by which the dispatcher can, as a train approaches, passes or leaves a siding, display stop, proceed or caution signals to the motorman. These signals are displayed by illuminated dials inside the cab directly in the motorman's view. The signal transmitting apparatus is interlocked so that it is mechanically and electrically impossible for the dispatcher to give signals corresponding to a lap order. Another strong feature of this system is that a permanent record is continually drawn before the dispatcher showing at all times the position and direction of the movement of all trains. This system of signaling has been in satisfactory operation on the Toronto & York Radial Railway for three years, controlling trains under 20-minute headway.

The Indianapolis & Cincinnati Traction Company installation includes protection for nine blocks and ten sidings, each block extending from siding to siding and averaging about two miles in length. The most attractive features of this system are its simplicity, flexibility and elasticity. The principal mechanical and electrical circuits consist each of an iron wire connecting short sections of third-rail at the sidings with relays and small switches and a battery in the dispatcher's office. The return circuit is over the track rails. The system is designed on the normal danger plan; that is, if any part of the apparatus becomes deranged stop signals are displayed. The apparatus on the car is very simple. In consists only of a third-rail shoe for making contact with the short signal rail, a relay and a small local battery for supplying energy to the signal lamps. Either a clear or a stop signal is always displayed before the motorman.

The Indianapolis & Cincinnati Traction installation includes no change in principle from that underlying the installation which has operated so satisfactorily for three years on the Toronto suburban lines.

PRINCIPAL PARTS OF THE SYSTEM

The principal parts of this system consist of a main control circuit leading from the dispatcher's office to each siding, a switch relay and battery connection in the dispatcher's office for each control circuit, three short (about 75 ft. long) sections of contact rail for each siding and a contact shoe relay, local battery and two (red and green) light

* The following description is an abstract of an article appearing in the *Electric Railway Journal*, June 8, 1912, page 968.

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signals on each motor car. The control line for each siding is independent of the other control lines except that all of the dispatcher's switches (one in each control circuit) are mechanically interlocked.

Main Signal Circuit

One independent signal wire connects the three contact rails at each siding direct with the dispatcher's switchboard and the return circuit is made through the track rails, which do not need to be cut at the siding. For the main signal circuit on this 18 mile installation about 100 miles of line wire have been erected. This wire is No. 14

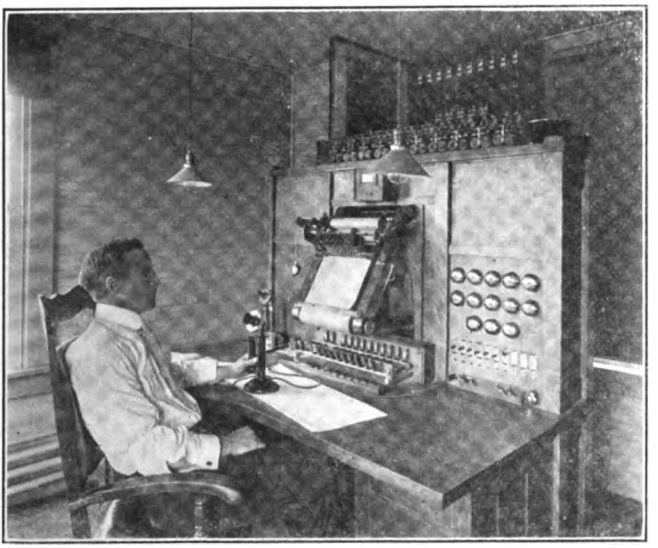

FIG. 38. SHOWING SIGNAL CONTROL BOARD, TRAIN-RECORDING APPARATUS AND TELEPHONE SWITCHBOARD.

copper clad which was chosen of this size not because so great a conductivity was required but because it was thought this was the smallest wire that would serve mechanically. The short lengths of contact rail are located one opposite the switch and two others, 2,000 ft. distant in each direction. The rail at the siding is called the home rail and the other two are called distant rails. By means of the two rails located 2,000 ft. from the siding it is possible to inform the crew of its signal, sufficiently far in advance to permit the stop to be made before the siding is reached. That is to say, if two trains are approaching a siding where they are to meet, they will receive red signals when 4,000 ft. apart and each train will yet have 2,000 ft.

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distance remaining in which to come under control to make the siding stop.

The three short pieces of third-rail at the siding are electrically connected by the single line wire and this wire without other connection extends along the pole line direct to the dispatcher's office. This forms the main circuit for the siding. The circuit on entering the dispatcher's office, passes through a knife switch, then through a fused lightning arrester and then through a 300-ohm relay mounted on the top of the dispatcher's control switch and thence through a common 30-volt battery to a ground on the track rail.

One of these main control circuits is installed for each siding and only the parts enumerated are in circuit at any time. Each main control circuit normally is open at the track end, the opening occurring between the track rail and the short contact rail. When a car passes, the contact shoe attached to the side of the truck touches the third-rail. The circuit is then completed through a relay on the car and through the running gear of the gear to the rail. Thus the car relay is put in series with the relay and the dispatcher's control switch at the central office.

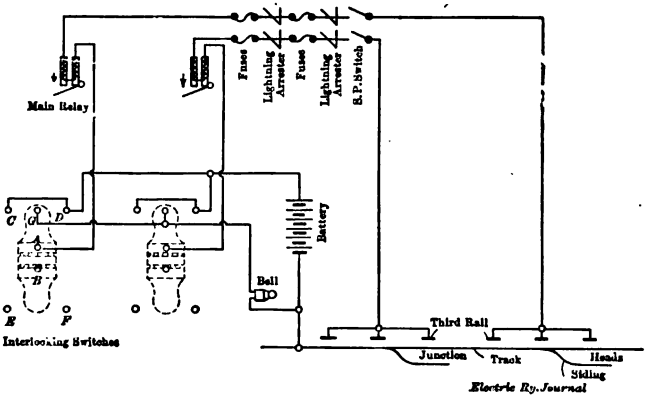

FIG. 39. SHOWING DIAGRAM OF TWO MAIN CONTROL CIRCUITS.

The only part of the apparatus in this main circuit with which the dispatcher has anything to do in normal operation is the small control switch on his board by which the circuit can be opened or closed. There are ten of these switches in this signal installation, one controlling the main circuit leading to each of the ten sidings which protect the nine blocks. This switch consists of a single steel stem on which are mounted an interlocking segment and a contact piece which, as the switch is revolved through 45 deg., makes contact with either of three similar contact pieces fixed on a slate panel.

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Control Switches

There is a dispatcher's switch for controlling the circuit leading to each siding. The position of the switch handles indicates the signal that will be displayed on a car when its shoe touches any one of the three short sections of contact rail at or near that siding. The row of switches controlling the signal indications at each siding is so interlocked that both eastbound and westbound trains cannot be given clear signals for the same block. The nearest to each other that they can approach under clear signals is 4000 ft., or each train 2000 ft. distant from the same siding, when each will receive a red signal and have ample distance in which to stop before reaching the siding.

The psychological effect of placing before the dispatcher a continuous indication as given by the position of the switch handles, of the running rights of all trains anywhere on the road, is a most important feature of this signal system, especially when this feature is supplemented by a continuous record sheet indicating the position, direction and speed of all trains at all times.

Car Equipment

The simplicity of the local circuit on the car is apparent when it is stated that this circuit includes only one relay, one local battery, two signal lights and a ruggedly constructed third-rail contact shoe. Each motor carries two ground-glass signal dials mounted, one above the

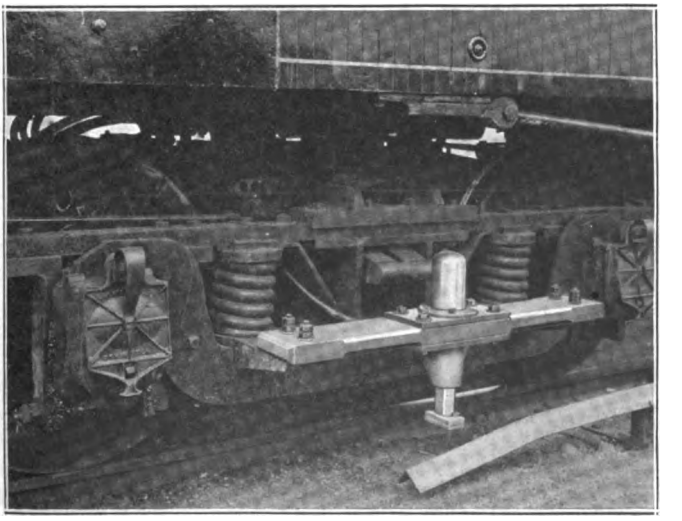

FIG. 40. SHOWING THIRD-RAIL CONTACT SHOE.

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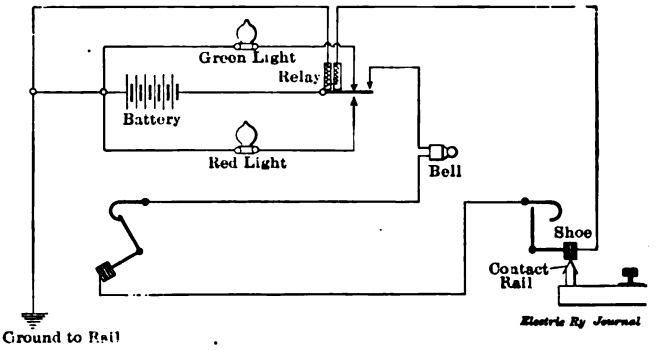

FIG. 41. SHOWING DIAGRAM OF CAR CIRCUIT.

FIG. 42. SHOWING CAB INDICATOR SIGNAL.

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other, on a substantial frame attached to the window post in front of and just to the left of the motorman's position, as shown in an accompanying view. One signal glass is red; the other is green. Both are provided with small incandescent lamps for illumination. Energy for these lamps is furnished by a small local battery. The other apparatus on the car, as shown by the circuit diagram, consists of a relay with two back contacts and one front contact, and a contact shoe which is attached to the truck equalizer beams, as shown in Figs. 40 and 41.

The principle of this cab signal is that if a contact rail is energized (by the closing of the dispatcher's control switch), then a passing train will receive a clear signal; if the contact rail is de-energized (purposely by the dispatcher opening the control switch, or because of a line wire derangement), then a passing train will receive a stop signal. A clear signal will continue to show while running through the block, and a stop signal, once displayed, will remain displayed until the car reaches an energized contact rail. This set of circumstances in connection with the interlocking features of the signal system provides for extreme flexibility in the handling of trains in sections at passing and meeting points.

This system is designed to do the work not only of an automatic block system but also of the so-called "dispatcher's" signal system, because the dispatcher may at any time stop any train at any siding.

Train Record Sheet

The record sheet is directly driven through a worm and ratchet movement which is operated every five seconds by a pair of magnets controlled by a carefully adjusted block movement. The vertical scale on the record sheet, one inch, equals ten minutes, and the horizontal scale is subdivided according to distance. The subdivisions are made by continuous vertical lines, the space between any two adjacent lines representing, proportionately, the distance between these two sidings. The record sheet is so arranged in its moving mechanism that about two hours' performance is always visible to the dispatcher so that he can see the changes that are being made in the record as they occur.

The movement of trains is recorded on the sheet by needle punches, and whenever a train passes a contact rail slits are cut in the paper. The ends of the slits show the time a train enters and leaves each block. The punches are made by needles mounted above the record sheet and the slits are made by needles mounted below the sheet. They are called "top" and "bottom" needles. Each needle is actuated by an electromagnet and these magnets are energized through front contacts on the relays in the dispatcher's control circuits.

The essential features of the Simmen record system are the main control line relay and the single-punching top needle. The line-cutting bottom needles are used as refinements to make the records more readable. This simple circuit with its top needles and local battery con-

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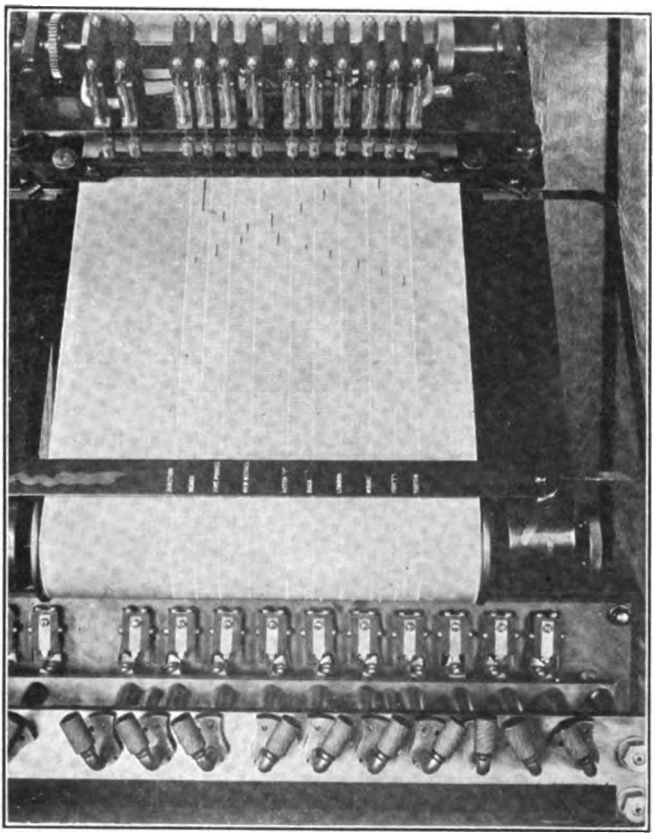

FIG. 43. SHOWING RECORD SHEET IN SERVICE, WITH RECORDS MADE BY TWO OPPOSING TRAINS.

trolled by the front contacts on the main relay in the main line control, would serve to give all the indications required for a complete signal system. However, additional features are added to enhance the legibility and value of the record and to increase the flexibility of train control. The chief feature for obtaining these supplementary results is a set of magnet-operated needles which perforate the paper from below and in contrast with the top needles which merely make a dot, the bottom needles cut a line in the paper recording the full time which a train occupies in running through a block. The time of arriving and leaving at the division point between the blocks is indicated as well as the time used in passing through the block.

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The record sheet also checks the dispatcher and shows just how the switches have been set for all train movements, the location of the lines in the columns indicating whether the switch was set for eastbound or westbound movement.

Operating Features

The signal system has no connection at all with the car-propulsion current supply, and thus when the power goes off from the transmission line there is no reason why cars cannot coast down hill or proceed under any momentum that they may have and thus be able to save some time.

All the testing work necessary in connection with obtaining high continuity of service from this signal system can be done in the dispatcher's office. Open-switch protection has been provided at low cost with the Simmen signal system by placing a standard switch circuit controller so that it will be operated by the movement of the switch-point and when the switch is set open the controller will open the line which connects the contact rails with the dispatcher's office. Thus approaching trains may receive stop signals when 2000 ft. away from an open switch.

With regard to maintenance of the signal system, it is noted that all of the pieces of apparatus are located either in the dispatcher's office or in the cab of a car, the two places on the road where they can most easily and economically be inspected.

Installation of the Automatic Signal and Appliance Co.

The system for single track work comprises two contactors, two signal boxes and a master controller. Contactors operate at any speed, and are set about 700 feet in advance of the signal. As car approaches a clear block displaying green light and semaphore arm at clear or perpendicular position and passes on under contactor it throws the signal at the far end of the section or block to "stop" position. This operates an interlocking circuit which drops the signal the car is approaching to "caution" or "middle" position, displaying a yellow light, at same time the master controller counts one car in the block. As the second car passes the entering contactor the lamp in the signal box that the car is approaching is extinguished, and the hood rises for about five seconds, giving the motorman indication that the contactor is working and that the master controller has likewise counted his car or train into the block. As the cars leave the block they are counted out until all cars have cleared when the signals assume the upright or cleared position.

Spacing signals and contactors are similar to the ones heretofore described. The contactor being set about 100 feet in advance of semaphore, as car passes under same it throws semaphore to stop position.

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When car has cleared the section which is being protected another contactor is passed which clears up the semaphore permitting the next car to pass through the protected section.

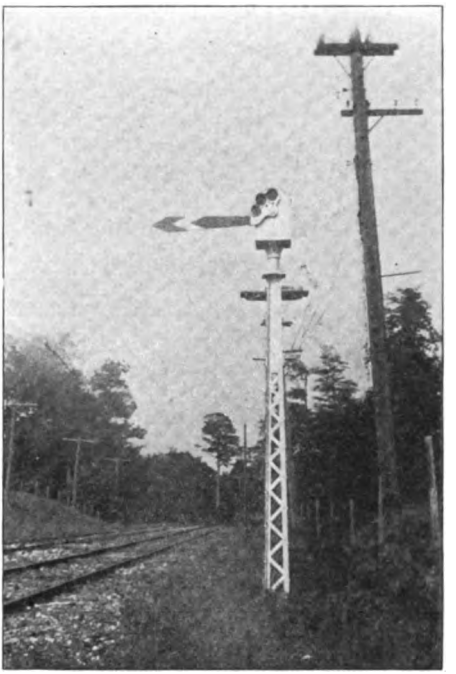

FIG. 44.— SHOWING SPACING SIGNAL AS USED ON DOUBLE TRACK OF THE LAKE SHORE ELECTRIC RAILWAY.

Railway Signal Association standard semaphores are used and one 40 watt tungsten lamp burns continually. The resistance in series with this lamp keeps all the working parts warm in cold weather as the lamp and resistance are enclosed in the signal box. The lamp is so wired that in case it should burn out another lamp of lower voltage immediately cuts in to take its place.

The Figs. 45 and 47 show both ends of single track section on the Lake Shore Electric Railway at Vermilion, O., with a car entering the block from the east, signal having moved to the middle position. The iron box on pole (shown also in Fig. 44) at west end of block contains the master controller which counts the cars in and out of the block.

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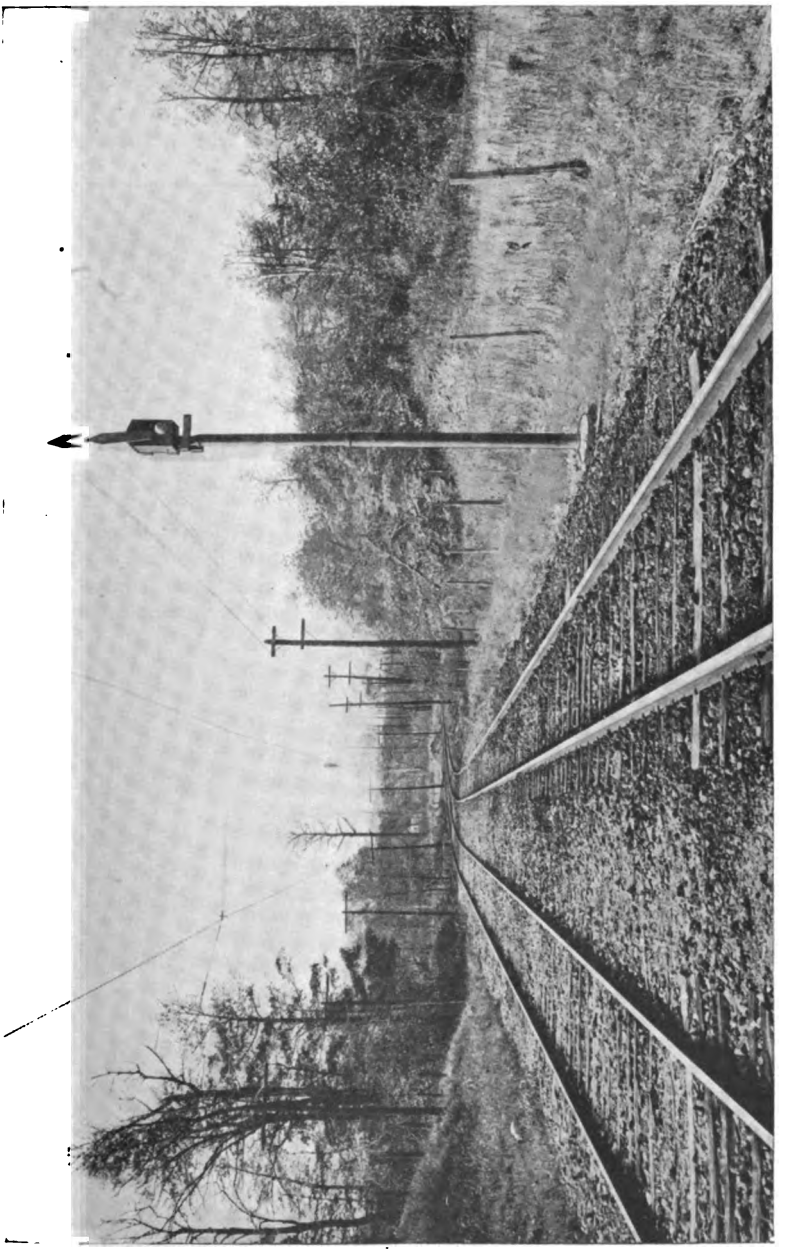

FIG. 45.— SHOWING BLOCK SIGNALS ON LAKE SHORE ELECTRIC RAILWAY.

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Three wires are required between signals and the master controller. These signals are operated daily by cars running at 60 miles per hour or more as they approach the block from the west entering the town of Vermilion.

The contactor as shown in Fig. 46, is so arranged that it has no moving parts to come in contact with the trolley wheel, in case a car

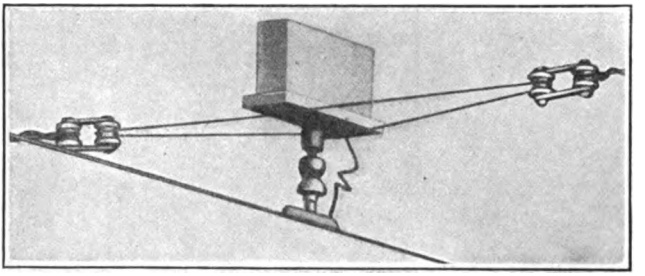

FIG. 46.— SHOWING TROLLEY CONTACTOR.

should coast under it while power is off the line it leaves the switches in contactor set so the signals immediately show the location of the car that coasted under the contactor when the power comes back on the line. A car can stand under the contactor without damage to it or the car.

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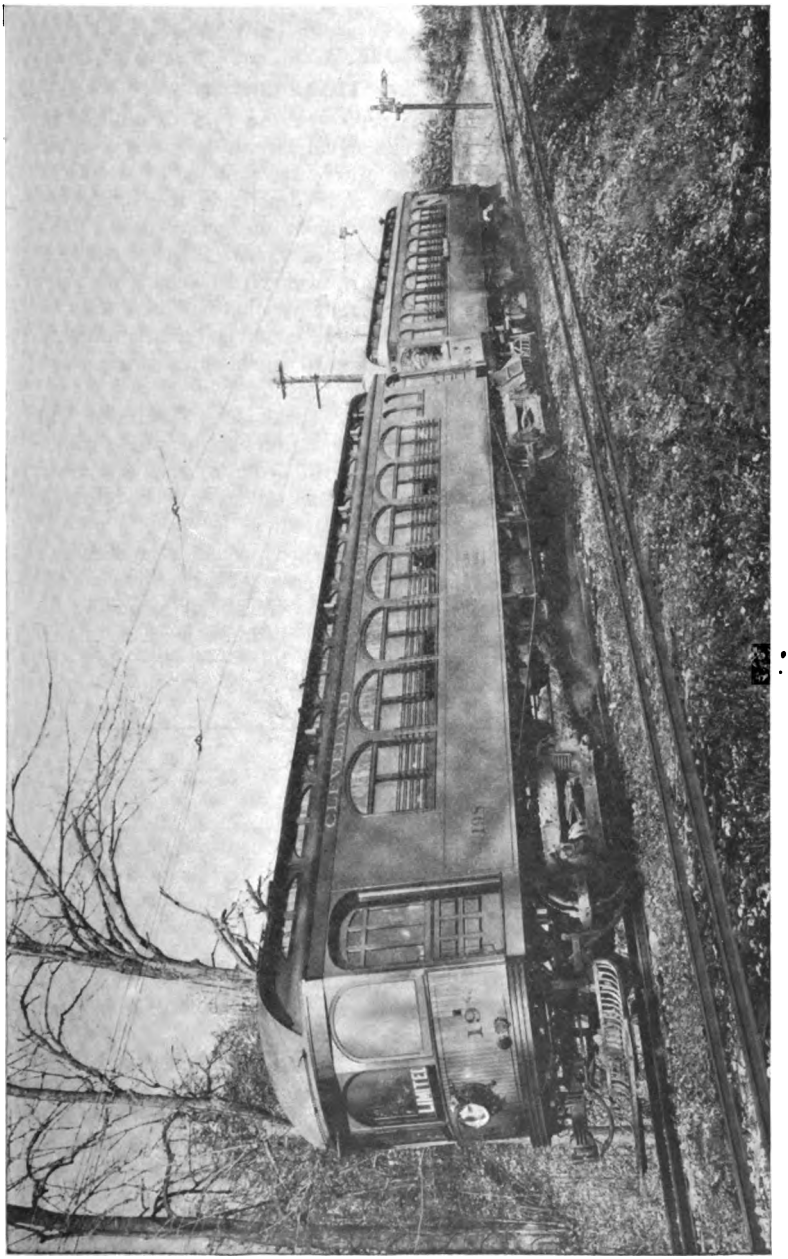

FIG. 47.— SHOWING CAR ENTERING BLOCK ON THE LAKE SHORE ELECTRIC RAILWAY.

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APPENDIX B

SIGNAL LOCATION AND ARRANGEMENT.

In reporting on that part of the report of the 1911 Committee in which it was requested that numerous signal layouts be given to meet the requirements as outlined for five different conditions of traffic; it was thought best to confine this report to describing the signal arrangements as now in use on several prominent interurban roads. This was done on account of the large number of varying factors entering into each particular case, making the arrangement of signals on each road a study in itself, affected only generally by what has been done on some other road. In addition to the above mentioned descriptions, a few of the principles affecting the location of signals on a single track railroad are also given.

In the majority of interurban roads to be signaled the traffic will rarely be dense enough to make necessary the dividing of the distance between sidings into supplemental blocks in order to facilitate train operation, therefore only such arrangements where a block extends from one siding to the other will be considered.

As a method of illustration the two signals as used for protecting a dangerous curve, will be considered. Signals are usually, where possible, placed upon the right hand side of the track looking in the direction of the traffic which they govern; therefore in Fig. 46, Signal

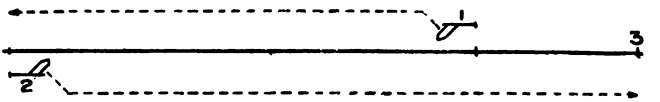

FIG. 48.— CURVE PROTECTION.

1 governs west bound cars and Signal 2 east bound, the dangerous or obscured track lying between the two signals. The space between the two signals is called a block. The dotted lines show the control limits of the two signals, or in other words, the extent of the track which controls the signals. For instance, a car anywhere between Signal 2 and point 3 will cause Signal 2 to remain in the "Stop," horizontal position, while Signal 1 is affected only when the car is between Signals 1 and 2.

Were Signal 2 controlled only up to Signal 1, it would then be possible for two cars to simultaneously pass Signals 1 and 2 each receiving a proceed indication. This must, of course, be avoided and it is usually accomplished by the use of a setting section, or preliminary, extending beyond one of the Signals, as 1–3. By the use of this preliminary a car running west sets Signal 2 to stop after passing point 3, and in case an east bound car has not already passed Signal 2, it

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would be stopped by it. In case, however, the east bound car had passed Signal 2 before the one west bound passed point 3, Signal 1 would be set to stop, being controlled to Signal 2, and the west bound car would be stopped at Signal 1. It must be understood that the fact that Signals 1 or 2 be in the proceed position gives the governed car the right to proceed only up to the opposing signal, or through the block, for if, as in the last mentioned case, an east bound car passes Signal 2 before the west bound car passes point 3, the latter will stop at Signal 1 and the opposing car, having had a proceed signal at 2, might meet with an accident. If a preliminary were used on both ends, or the control of each signal were extended out beyond the other, two opposing cars might get into the preliminary sections at the same time. In this event both signals would assume the stop position and neither car could proceed. It is therefore desirable to locate the signals, in a case of this kind, at least, braking distance from the point of curve so that in case one car is standing at a signal an opposing car rounding the curve will be able to stop before reaching the signal.

Should two following cars approach a protected curve close together, the second car would be stopped by the signal until the first car had passed beyond the limits of control of that signal.

In general, the description of a curve protection given above is the nucleus of the more complicated forms of siding protection, the principle being the same throughout and additions being made as the traffic conditions require it.

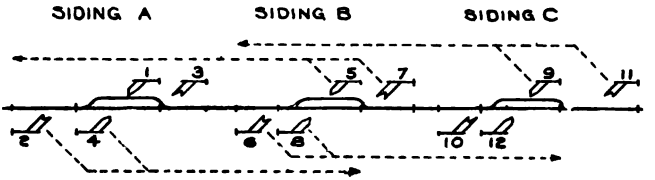

FIG. 49.— SIDING PROTECTION.

Referring to the layout in Fig. 49, which shows the arrangement used on one of the largest installations on an interurban railroad; the Signals 4 and 5, and 8 and 9 divide the section of track shown into two blocks, and each pair corresponds to the two curve protection signals in Fig. 48; in that there are two opposing signals with a setting section for each; the distance 2–4 being the preliminary for Signals 4–5; and 6–8 for 8–9; as shown by the dotted lines. With this arrangement a car passing Signal 2 sets Signal 5 to Stop, Signal 1 having already been set to stop from the siding off the print to the left.

It will be seen that the block 4–5 extends a short distance into the block 8–9 thus overlapping 8–5. This distance is what is known as an

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overlap and in this case is the space separating two opposing cars when both have come to a stop at their governing signal.

The use of distant or caution signals, for controlling the approach of cars to the home signals; of switch boxes for setting signals to stop when a switch is misplaced, and of indicators for various purposes, are all side issues which may, or may not, be used according to the varying traffic conditions encountered.

Under certain conditions the two home signals such as 5 and 8 may be safely placed opposite in this way effecting considerable economy. When this is done, however, the location of the signals is a matter for careful consideration. For instance, in the following sketch a car in either direction entering the siding would with the signals as located in dotted lines affect the signals at each of the adjoining sidings, due to the necessity for this car to enter both track sections in order to get into the siding.

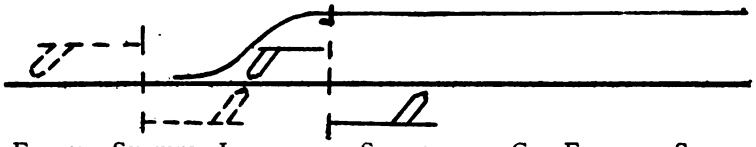

FIG. 50. SHOWING LOCATION OF SIGNAL WITH CAR ENTERING SIDING.

While, with the signals located as shown in full lines, a car can enter the siding from the left without affecting the signal at the next adjoining siding on the right, which is, of course, to be desired.

Among the various features entering into the subject of locating signals, the following are probably the most important:

The maximum braking distance of trains as affected by their speed and weight and by the grades encountered.

The locations of sidings, stations, curves and like physical features of the right-of-way.

The headway of trains to maintain the schedule.

The distance at which signals can be easily read and interpreted.

The "preliminary" section as described above should not ordinarily be less than 1000 ft., while 1500 ft. is to be preferred.

DESCRIPTIONS OF LAY OUTS SHOWN IN ACCOMPANYING FIGURES

Fig. 51 shows suggested arrangements of trolley contact signals, the signals being located about half-way between the point of frog and the point of switch so that they may be equally well seen from a car on the siding as well as a car on the main line.

The signal may or may not be designed to permit permissive following operation, that is, allowing one train to follow another into an occupied block under a special signal indication designed to show the motorman that the block is already occupied.

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FIG. 51. SHOWING TYPICAL ARRANGEMENT OF SIGNALS WITH TROLLEY CONTACT.

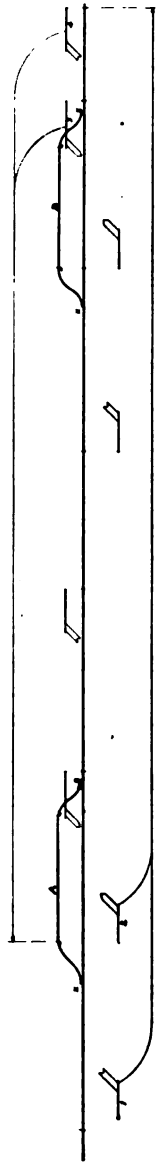

FIG. 52. SHOWING SIGNAL LAYOUT SIMILAR TO THAT INSTALLED ON EHE ILLINOIS TRACTION SYSTEM.

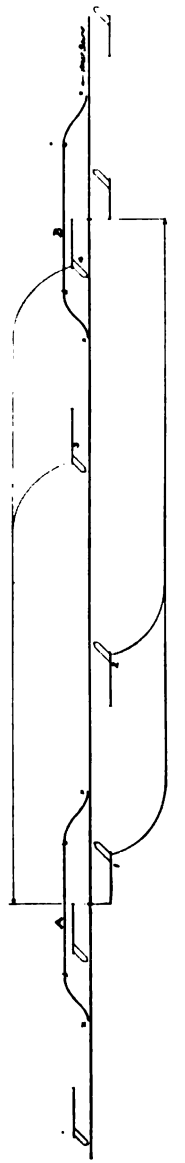

FIG. 53. SHOWING LAYOUT SIMILAR TO THAT INSTALLED ON THE WASHINGTON, BALTIMORE AND ANNAPOLIS ELECTRIC RAILWAY WITH THE EXCEPTION THAT SIGNALS 2 AND 3 WERE LIGHT SIGNALS.

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The contactor should preferably be of the instantaneous type, that is, one in which the contact is immediately made and broken, in this way eliminating the danger of a double registration either into or out of the block.

The operation under the arrangement given is as follows: A car passing under contactor b when both signals are neutral causes a proceed indication to be given at 1 and a stop indication at 2. An opposing car approaching 2 should therefore stop before his trolley passed contactor c until the car bound from A to B passed into siding B and over contactor c; which would restore the signals to the neutral position. The car bound from B to A could then proceed under c setting 2 to proceed and 1 to stop. The second car, in the siding, could then either back out registering in as a second car when passing c and counting out again when passing c, or it could run through the siding to d′ and providing the signal was not at stop, could proceed under d′, observing the signal meanwhile and if the proper indication was received, proceed on its way.

With this arrangement it should be noted, however, that the track between contactors c and d, c′ and d′, and a and b and a′ and b′ is unprotected. Various other arrangements can of course be worked out to meet different operative conditions.

Fig. 52 shows the signal arrangement as installed on the Illinois Traction System. This includes four signals to each siding unit, two home and two distant signals for each.

The block is from 2–3 and the preliminary from 3–4. The preliminaries have in this installation always been placed on the south end of the siding, and the south bound home signals were placed at the fouling point of the siding instead of at the switch point. With this arrangement two opposing trains cannot get closer than the distance between home signals, which is approximately the length of the siding. All cars are compelled to head-in and back-out of all double end sidings. A car running from A to B may enter siding A without affecting Signal 3, as 3 is only controlled to 2. This allows a car running from B to A to proceed up to Signal 5 without being affected by the opposing car beyond 2. Considering now that siding B is a meeting point and the car approaching B from the right reaches Signal 4 before the opposing car passes Signal 2, if the former car proceeds past Signal 4 it will set Signal 2 to stop and hold car at this signal until the car near B reaches the siding and enters same. This would naturally delay the opposing car at A.

A rule has therefore been made that northbound cars (the preliminary is on the south end), approaching a meeting point and finding the distant signal clear, which indicates that the opposing car has not passed 2, must stop, and after waiting one minute call the dispatcher for orders as to a possible change of meeting points. With a reasonably close meet the car at A will have passed Signal 2 before the

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opposing car reaches Signal 4, so that neither car is stopped until siding B is reached. The first car to arrive takes the siding, heading in and closing the switch. This clears the signal at the opposite end of the siding and the opposing car proceeds. The car in the siding then backs out and receiving a clear home signal proceeds. A southbound car reaching the meeting point and entering the siding before the northbound car comes into view, must keep the switch set for the siding so as to hold the northbound distant signal at caution until the northbound car passes it, the switch may then be closed, which clears the home signal and allows the northbound car to proceed without delay.

Fig. 53 shows the arrangement of signals in the recent installation on the Washington, Baltimore & Annapolis. This is rather novel in that there is but one circuit from siding to siding and no real preliminary is used, the block extends from 1 to 4 and in order to prevent two cars passing these signals at the same instant and both getting clear signals, advance Signals 2 and 3 are used so that if this were to occur both cars would be stopped at Signals 2 and 3 respectively.

Considering siding "B" as a meeting point, cars may approach from either direction up to Signal 4 without affecting the adjacent signals in any way. At the double ended sidings either car may enter the siding and allow the opposing one to proceed, while at single ended sidings that car facing the point of the switch should take siding, the other car standing on the main track back of the signal until it assumes the proceed position.

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APPENDIX C

COMPANIES REPLYING TO DATA SHEET 90

1. Albany Southern Railroad Co., Albany, N. Y.
2. Altoona and Logan Valley Electric Railway Co., Altoona, Pa.
3. Aurora, Elgin and Chicago Railroad Co. (The), Wheaton, Ill.
4. Austin Street Railway Co., Austin, Texas.
5. Bangor Railway and Electric Co., Bangor, Me.
6. Bay State Street Railway Co., Boston, Mass.
7. Birmingham Railway, Light and Power Co., Birmingham, Ala.
8. Boston Elevated Railway Co., Boston, Mass.
9. Bucks County Electric Railway, Newtown, Pa.
10. Capital Traction Co. (The), Washington, D. C.
11. Central Pennsylvania Traction Co., Harrisburg, Pa.
12. Chicago, Lake Shore and South Bend Railway Co. (The), Michigan City, Ind.
13. Chicago, South Bend and Northern Indiana Traction Co., South Bend, Ind.
14. Chippewa Valley Railway, Light and Power Co., Eau Claire, Wis.
15. Cincinnati, Lawrenceburg and Aurora Electric Street Railroad Co. (The), Cincinnati, Ohio.
16. Denver City Tramway Co. and Denver and Northwestern Railway Co., Denver, Colo.
17. Duluth Street Railway Co. (The), Duluth, Minn.
18. Easton Transit Co., Easton, Pa.
19. Elmira Water, Light and Railroad Co., Elmira, N. Y.
20. Evansville Railways Co., Evansville, Ind.
21. Fairmont and Clarksburg Traction Co., Fairmont, W. Va.
22. Fonda, Johnstown and Gloversville Railroad Co., Gloversville, N. Y.
23. Fort Wayne and Northern Indiana Traction Co. (The), Fort Wayne, Ind.
24. Galesburg and Kewanee Electric Railway Co., Kewanee, Ill.
25. Hartford and Springfield Street Railway Co., Warehouse Point, Conn.
26. Illinois Traction System, Peoria, Ill.
27. Indiana Union Traction Co., Anderson, Ind.

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28. Ithaca Street Railway, Ithaca, N. Y.
29. Iowa and Illinois Railway Co., Davenport, Iowa.
30. Kansas City-Western Railway Co. (The), Leavenworth, Kan.
31. Kingston, Portsmouth and Cataraqui Electric Railway Co., Kingston, Ont.
32. Knoxville Railway and Light Co., Knoxville, Tenn.
33. Kokomo, Marion and Western Traction Co., Kokomo, Ind.
34. Lackawanna and Wyoming Valley Railroad Co., Scranton, Pa.
35. Lehigh Valley Transit Co., Allentown, Pa.
37. Louisville Railway Co., Louisville, Ky.
38. Lynchburg Traction and Light Co., Lynchburg, Va.
39. Metropolitan Street Railway Co., Kansas City, Mo.
40. Milford and Uxbridge Street Railway Co., Milford, Mass.
41. Morris County Traction Co. (The), Morristown, N. J.
42. Muncie and Portland Traction Co., Portland, Ind.
43. New Jersey and Pennsylvania Traction Co., Trenton, N. J.
44. New York State Railways, Rochester, N. Y.
45. Northwestern Pennsylvania Railway Co., Meadville, Pa.
46. Omaha, Lincoln and Beatrice Railway Co., Lincoln, Neb.
47. Pacific Gas and Electric Co., Sacramento District, Sacramento, Cal.
48. Peoria Railway Terminal Co., Peoria, Ill.
49. Puget Sound Electric Railway, Tacoma, Wash.
50. Puget Sound Traction, Light and Power Co., Seattle Division, Seattle, Wash.
51. Quincy Horse Railway and Carrying Co., Quincy, Ill.
52. Roanoke Railway and Electric Co., Roanoke, Va.
53. Rhode Island Co. (The), Providence, R. I.
54. San Diego Electric Railway Co., San Diego, Cal.
55. San Francisco-Oakland Terminal Railways, Oakland, Cal.
56. Savannah Electric Co., Savannah, Ga.
57. Shore Line Electric Railway Co., Saybrook, Conn.
58. Southern Michigan Railway Co., South Bend, Ind.
59. Syracuse, Lake Shore and Northern Railroad Co., Syracuse, N. Y.
60. Syracuse Rapid Transit Co., Syracuse, N. Y.
61. Syracuse and Suburban Railroad Co., Syracuse, N. Y.
62. Terre Haute, Indianapolis and Eastern Traction Co., Indianapolis, Ind.
63. Texarkana Gas and Electric Co., Texarkana, Ark.
64. Twin City Rapid Transit Co., Minneapolis, Minn.
65. Twin State Gas and Electric Co., Brattleboro, Vt.
66. Utica and Mohawk Valley Railway Co., Utica, N. Y.
67. Valley Traction Co., Lemoyne, Pa.
68. Washington, Baltimore and Annapolis Electric Railway Co., Baltimore, Md.

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69. Washington Water Power Co. (The), Spokane, Wash.
70. Wilmington and Philadelphia Traction Co., Wilmington, Del.
71. Worcester Consolidated Street Railway Co., Worcester, Mass.
72. York Railways, York, Pa.
73. Wheeling Traction Co., Wheeling, W. Va.
74. Tacoma Railway and Power Co., Tacoma, Wash.
75. The Wilkes-Barre Railway Co., Wilkes-Barre, Pa.

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COMPILATION OF DATA COLLECTED BY JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS

Data Sheet No. 90 — July 1912

Key No.	Total miles		Line operated—Miles						Minimum headway						Key No.
			City		Suburban		Interurban		City		Suburban		Interurban		
	S. T.	D. T.	S. T.	D. T.	S. T.	D. T.	S. T.	D. T.	S. T.	D. T.	S. T.	D. T.	S. T.	D. T.	
1	20	17	2	.....	.....	.....	18	17	7½ min...	.....	.....	.....	1 hr. in winter; 10 min. in summer		1
2	[1] 37	14	24.5	2.6	13.0	11.40	.....	.....	4 min.[2]..	15 min.[3]..	.....	.....	.....	.....	2
3	125.59	42	33.08	2.03	.....	.....	92.51	42	15 min...	15 min...	.....	.....	30 min...	15 min...	3
4	18.7	2.83	18.7	2.83	.....	.....	.....	.....	6½ min...	.....	.....	.....	.....	.....	4
5	63.43	2.73	1.23	1.	7.27	1.73	53.2	.....	15 min...	15 min...	15 min...	15 min...	30 min...	.....	5
6	632.94	121.73	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
7	55.03	40.45	38.07	36.51	16.96	3.94	.....	.....	6 min....	5 min....	10 min...	6 min....	.....	.....	7
8	5.1	25.55	[4] 5.1	[4] 1.6	.....	.....	.....	[5] 13.95	5 min....	1 min....	.....	.....	.....	[6]	8
10	57.87	.....	.....	47.04	.....	10.83	.....	.....	.....	30 sec....	.....	3 min....	.....	.....	10
11	40.5	15.7	11.3	10.8	28.4	5.8	.....	.....	5 min....	1 min....	15 min...	2 min....	.....	.....	11
12	90	20	2	.....	.....	.....	88	20	15 min...	.....	.....	.....	35 min...	5 min....	12
13	100	21	45	15	.....	.....	59	2	7½ min...	.....	.....	.....	60 min...	.....	13
14	22	.....	12	.....	.....	.....	10	.....	15 min...	.....	.....	.....	20 min...	.....	14
15	[8] 38.14	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15
16	63.0	83.1	35.9	83.1	.....	.....	27.1	.....	.....	1 min....	.....	.....	10 min...	.....	16
17	[1] 16.73	31.85	16.73	31.85	.....	.....	.....	.....	20 min...	1 min....	.....	.....	.....	.....	17
18	49	2	20	2	.....	.....	29	.....	10 min...	2 min....	.....	.....	30 min...	.....	18
19	25.09	3	22.09	.....	3	.....	.....	.....	7½ min...	4 min....	15 min...	.....	.....	.....	19
20	56.32	.....	4.96	.....	.....	.....	51.36	.....	.....	.....	.....	.....	.....	.....	20
21	26	.....	1	.....	.....	.....	25	.....	.....	.....	.....	.....	1 hour...	.....	21
22	34.34	22.31	16.13	1.08	2.29	.....	13.92	21.23	5 min....	5 min....	15 min...	15 min...	30 min...	30 min...	22
23	248	17	62.58	16.76	.....	.....	137.65	10.06	10 min...	5 min....	.....	.....	60 min...	.....	23
24	14	.....	5.5	.....	.....	.....	8.5	.....	10 & 20 m.	.....	.....	.....	1 hour...	.....	24
25	48	2	.....	.....	48	2	.....	.....	.....	.....	1 hour...	1 hour...	.....	.....	25
26	434.77	2	.....	.....	.....	.....	434.77	2	.....	.....	.....	.....	50 min...	40 min...	26
27	365	11	51	9	.....	.....	314	2	10 min...	3 min....	.....	3 min....	[9] 30 min..	[9] 30 min..	27

[1] Including short turnouts, etc. [2] Except city loop. [3] One min. during park season. [4] Surface. [5] Elevated, 8.22; subway, 5.73.
[6] Elevated, 1½ min., subway, 2 min. [8] Including 6 miles double track. [9] With occasional headway of 10 min.

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COMPILATION OF DATA COLLECTED BY JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS — Continued

Key No.	Total miles		Line operated—Miles						Minimum headway						Key No.
			City		Suburban		Interurban		City		Suburban		Interurban		
	S. T.	D. T.	S. T.	D. T.	S. T.	D T	S. T.	D. T.	S. T	D. T.	S. T.	D. T.	S. T.	D. T.	
28	9.5	1	9.5	1	.....	.....	.....	.....	10 min...	10 min...	.....	.....	.....	.....	28
29	40	2	3	2	.....	.....	35	.....	30 min...	10 min...	.....	.....	45 min...	.....	29
30	25	7	7	.....	.....	.....	25	.....	5 to 20 m.	.....	.....	.....	1 hr.; Sunday 30 min.	.....	30
31	8	.....	8	.....	.....	.....	.....	.....	10 min...	.....	.....	.....	.....	.....	31
32	24.54	10.81	14.21	7.74	10.30	3.06	.....	.....	5 min....	2 min....	15 min...	10 min...	.....	.....	32
33	38	.....	10	.....	.....	.....	28	.....	10 min...	.....	.....	.....	1 hour...	.....	33
34	1.89	20.74	.....	.....	.....	.....	1.89	20.74	.....	.....	.....	.....	5 min....	5 min....	34
35	[10] 121	[11] 12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35
37	91.45	83.54	.....	74.86	4.46	8.69	87.1	.....	.....	2 min....	7½ min...	.....	15 min...	.....	37
38	.....	.....	.....	.....	.....	.....	.....	.....	12 min...	12 min...	.....	.....	.....	.....	38
39	15.95	124.69	15.95	111.73	.....	11.11	[2].....	[12].....	.....	3½ min...	.....	5 min....	.....	.....	39
40	48	1	8	1	25	.....	15	.....	15 min...	15 min...	30 min...	.....	60 min...	.....	40
41	40	10	.....	5	.....	.....	40	5	.....	15 min...	.....	.....	30 min...	30 min...	41
42	31.70	.....	.....	.....	.....	.....	31.70	.....	.....	.....	.....	.....	.....	.....	42
44	.....	.....	.....	.....	.....	.....	76.22	3.26	2 min....	23 sec....	3 min....	1½ min...	30 min...	.....	44
45	28	.....	11	.....	.....	.....	17	.....	.....	.....	.....	.....	.....	.....	45
46	5.23	.....	.....	.....	5.23	.....	.....	.....	.....	.....	30 min...	.....	.....	.....	46
47	9.63	15.16	.....	.....	.....	.....	.....	.....	10 min...	10 min...	.....	.....	.....	.....	47
48	8	2	.....	2	.....	.....	8	2	.....	20 min...	.....	.....	17.6 min.	.....	48
49	31.7	16.8	.....	6.2	.....	.....	31.7	10.6	.....	5 min....	.....	.....	10 min...	10 min...	49
50	198.90	.....	37.71	161.20	.....	.....	.....	.....	8 min....	40 sec....	.....	.....	.....	.....	50
51	18.5	4	18.5	4	.....	.....	.....	.....	15 min..	7½ min...	.....	.....	.....	.....	51
53	272.23	45.61	168.86	35.60	103.37	10.01	.....	.....	10 min...	5 min....	30 min...	15 min...	15 min...	.....	53
54	7	63	[14] 7	[14] 63	.....	.....	.....	.....	[14] 10 min..	[14] 5 min...	.....	.....	.....	.....	54
55	144.33	[15] 79.41	143.83	79.41	.....	.....	.....	.....	10 min...	45 sec....	.....	.....	.....	.....	55
56	30.53	12.96	11.80	9.81	18.73	3.15	.....	.....	10 min...	7½ min...	15 min...	7½ min...	.....	.....	56
57	50	.....	.....	.....	.....	.....	50	.....	.....	.....	.....	.....	30 min...	.....	57
58	36	3	3	1	.....	.....	.....	.....	60 min...	60 min...	.....	.....	60 min...	60 min...	58
59	14	6	.....	.....	.....	.....	14	6	.....	.....	.....	.....	15 min...	2–3½ min.	59
60	27.63	31.46	13.33	28.76	14.30	2.70	.....	.....	4 min....	4 min....	4 min....	4 min....	.....	.....	60
61	12.5	2.5	.....	2.5	.....	.....	12.5	.....	.....	30 min...	.....	.....	30 min...	.....	61
62	384.36	10.25	16.51	10.25	.....	.....	347.35	.....	15 min...	15 min...	.....	.....	1 hour...	.....	62

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63	11	.5	9.5	.5	1.5	.....	.....	.....	15 min...	5 min....	.....	.....	.....	.....	63
64	57.89	[16]153.9	16.73	137.13	41.16	16.77	.....	.....	.....	20 sec....	30 min...	10 min...	.....	.....	64
65	5	.....	5	.....	.....	.....	.....	.....	½ hr.....	.....	.....	.....	.....	.....	65
66	32.61	.....	[17]23.33	15.35	[17]9.48	29.91	20	20	2 min....	2 min....	15 min...	15 min...	30 min...	30 min...	66
67	39	1	.....	.....	.....	.....	39	1	.....	.....	.....	.....	16 min...	.....	67
68	21.33	40.54	1.28	8.38	.....	.....	20.05	32.16	7 min....	1 min....	.....	.....	5 min....	5 min....	68
69	111.19	35.74	14.90	35.74	.....	.....	22	8.73	2½ min...	2½ min...	.....	.....	5 min....	5 min....	69
70	100	21	38.50	17.50	7	.....	37	.....	6 min....	3–5 min..	10–30 min.	.....	15–30 min	.....	70
71	285	43	86	43	96	6	48	4	1 hour...	1 hour...	1 hour...	1 hour...	1 hour...	1 hour...	71
72	64.54	8.76	12.51	5.46	37.17	1.97	14.86	1.33	10 min...	5 min....	1 hour...	1 hour...	1 hour...	1 hour...	72
73	87	30	.....	20	41	10	16	.....	.....	5 min....	8 min....	8 min....	30 min...	.....	73
74	46.7	21.3	24.3	21.3	22.4	.....	.....	.....	10 min...	1 min....	20 min...	.....	.....	.....	74
75	61.26	17.42	15.86	3.07	32.10	6.97	13.30	7.38	[18]2½ min..	[18]4 min....	[18]5½ min..	[18]5 min...	[18]15 min..	[18]15 min..	75

[10] 133 miles first track. [11] Second track, 12 miles. [12] Elevated, 1.7 miles; subway tunnel, .15 mile. [13] Elevated, 3½ miles; subway tunnel, 3½ miles. [14] Including suburban. [15] In addition yard tracks, etc., 17.88 miles. [16] Special track, 24.45 miles. [17] Sidings: City, 2.217 miles; suburban and interurban, 3.6 miles. [18] Each way. Included with suburban.

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COMPILATION OF DATA C LLECTED BY JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS — Continued

Data Sheet No. 90 — July 1912

Key No.	Maximum speed — miles per hour						Maximum service braking distance in feet	Contact used			Propulsion current A. C. or D. C.	Voltage	Key No.
	City		Suburban		Interurban			Trolley wheel	Pantagraph	Third-rail shoe			
	S. T.	D. T.	S. T.	D. T.	S. T.	D. T.							
1	8	.....	.....	.....	[1]21	[1]21	.....	Yes, in cities....	.....	Yes, on int. serv.	D. C.	550	1
2	30	30	30	30	.....	.....	150ft.at 30 m.p.h.	Yes, 4 and 5 in ..	.....	.....	D. C.	575	2
3	25	25	.....	.....	70	70	.....	Yes, Fox River Div. & city.	.....	Yes, Third-Rail Division.	D. C.	600	3
4	25	.....	.....	.....	.....	.....	.....	Yes, 4 in. Ideal..	.....	.....	D. C.	550	4
5	8	8	8	8	12	.....	120 feet.....	Yes.....	.....	.....	D. C.	550	5
6	.....	.....	.....	.....	.....	.....	.....	Yes.....	.....	.....	D. C.	600	6
7	7.77	9.69	21.04	12.40	.....	.....	300 feet.....	.....	.....	.....	D. C.	550	7
8	8	35	.....	.....	.....	[2].....	200 ft. surface...	Yes.....	.....	Lindall top contact.	D. C.	550	8
10	.....	20	.....	25	.....	.....	.....	Yes and plow...	.....	.....	D. C.	.....	10
11	8	8	20	20	.....	.....	.....	Yes.....	.....	.....	D. C.	600	11
12	25	.....	.....	.....	65	.....	1,200–1,500 feet.	.....	Yes.....	.....	A. C.	6,600	12
13	20	20	.....	.....	60	60	100 feet city, 500 feet interurban	Yes.....	.....	.....	D. C.	600	13
14	12	.....	.....	.....	30	.....	.....	Yes, 6-inch.....	.....	.....	D. C.	600	14
15	.....	.....	.....	.....	20	.....	200 feet.....	Hensley; V groove.	.....	.....	D. C.	550	15
16	9.7	9.7	.....	.....	17.3	.....	.....	Yes.....	.....	.....	D. C.	550	16
17	20	20	.....	.....	.....	.....	.....	Yes.....	.....	.....	D. C.	600	17
18	15	15	.....	.....	30	.....	250 to 600 feet..	Yes.....	.....	.....	D. C.	550	18
19	12	12	15	15	.....	.....	.....	Yes.....	.....	.....	D. C.	550	19
20	.....	.....	.....	.....	45	.....	600 feet.....	Yes.....	.....	.....	D. C.	600	20
21	.....	.....	.....	.....	35	.....	500 feet.....	Yes.....	.....	.....	D. C.	600	21
22	12	12	25	25	45	45	1,000 ft. approx.	V.....	.....	.....	D. C.	600	22
23	9	9	.....	.....	40	.....	.....	Yes.....	.....	.....	D. C.	600	23
24	20	.....	.....	.....	40	.....	200 feet.....	Yes.....	.....	.....	D. C.	600	24
25	40	40	.....	.....	.....	.....	.....	Yes.....	.....	.....	D. C.	600	25
26	.....	.....	.....	.....	50	40	1,000 feet.....	Yes, 6-in.....	.....	.....	D. C.	600	26
27	15	15	25	25	60	60	150 ft. city; 1,200 ft. int.	Yes.....	.....	.....	D. C.	600–650	27
28	20	20	.....	.....	.....	.....	300 feet.....	Yes.....	.....	.....	D. C.	550	28

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29	25	25	.....	.....	60	.....	.....	Yes	.....	.....	D. C.	600	29
30	8–12	.....	.....	.....	35	.....	.....	Yes, 4-inch	.....	.....	D. C.	600.	30
31	15	.....	.....	.....	.....	.....	150 feet	Yes	.....	.....	D. C.	500–550	31
32	8	8	15	15	.....	.....	150–200 feet	Yes, 4 & 5 inch Kalamazoo	.....	.....	D. C.	600–650	32
33	15	.....	.....	.....	50	.....	1,000 ft. int.	Yes	.....	.....	D. C.	600	33
34	.....	.....	.....	.....	50–60	50–60	1,200 feet	.....	.....	Yes	D. C.	650	34
35	.....	.....	.....	.....	.....	.....	.....	Yes	.....	.....	D. C.	550	35
37	.....	12	20	.....	45	.....	.....	Yes	.....	.....	D. C.	550	37
38	6–10	6–10	.....	.....	.....	.....	.....	Yes	.....	.....	D. C.	550	38
39	.....	9.8	.....	20	†	†	75–100 feet	Yes	.....	.....	D. C.	575	39
40	10	10	20	.....	25	.....	.....	Yes	.....	.....	D. C.	575	40
41	.....	25	.....	.....	25	25	250–300 feet	Yes	.....	.....	D. C.	550	41
42	.....	.....	.....	.....	40	.....	.....	Yes	.....	.....	D. C.	600–650	42
44	27	27	27	27	60	.....	800 feet	Yes	.....	.....	D. C.	575 city; 625 int.	44
45	12	.....	.....	.....	35	.....	.....	.....	.....	.....	D. C.	550–600	45
46	.....	.....	18	.....	.....	.....	100 feet	Yes	.....	.....	D. C.	550	46
47	18	18	.....	.....	.....	.....	60 feet	Yes, in all cases	.....	.....	D. C.	500	47
48	.....	15	.....	.....	30	.....	.....	Yes, Kalamazoo "U."	.....	.....	D. C.	550	48
49	.....	25	.....	.....	60	60	1,500 feet	Yes	.....	Yes	D. C.	600	49
50	12	12	.....	.....	.....	.....	.....	Yes	.....	.....	D. C.	600	50
51	8	10	.....	.....	.....	.....	90 feet	Yes	.....	.....	D. C.	500	51
53	7.32	8.76	17.34	18.12	27	.....	.....	Yes, 4½ & 6 in.	.....	.....	D. C.	600	53
54	20	20	.....	.....	.....	.....	60 feet	Yes	.....	.....	D. C.	550	54
55	35	38	.....	.....	.....	.....	850 feet	Yes	Brown Diamond trolley.	.....	D. C.	575	55
56	6.66	8.5	15	20	.....	.....	.....	Yes	.....	.....	D. C.	550	56
57	.....	.....	.....	.....	45	.....	500 feet	Yes	.....	.....	D. C.	1,200	57
58	20	20	.....	.....	60	60	.....	Yes	.....	.....	D. C.	600	58
59	.....	.....	.....	.....	55	30	1,200 ft. single track; 400 double track	Yes	.....	.....	D. C.	550–600	59
60	8	8	14–15	14–15	.....	.....	200 ft. with good rail.	Yes	.....	.....	D. C.	550	60
61	.....	12	.....	.....	35	.....	.....	Yes	.....	.....	D. C.	550	61
62	8	9	.....	.....	60	.....	1,000 feet	Yes	.....	.....	D. C.	650	62
63	7½	.....	.....	.....	.....	.....	.....	Yes	.....	.....	D. C.	550	63
64	.....	.....	50	50	.....	.....	800–900 feet	Yes	.....	.....	D. C.	600	64

[1] Including stops. [2] Elevated, 40; subway, 45. † Elevated 9.8; subway, 9.8 m. p. h.

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COMPILATION OF DATA COLLECTED BY JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS — (Concluded)

Key No.	Maximum speed — miles per hour						Maximum service braking distance in feet	Contact used			Propulsion current A.C. or D.C.	Voltage	Key No.
	City		Suburban		Interurban			Trolley wheel	Pantagraph	Third-rail shoe			
	S. T.	D. T.	S. T.	D. T.	S. T.	D. T.							
65	20	.....	.....	.....	.....	.....	100 feet.....	Yes.....	.....	.....	D. C.	600	65
66	8	8	.....	.....	.....	55	200 ft. with good rail, city; 600 ft int.	Yes.....	.....	.....	D. C.	550	66
67	8	.....	.....	.....	25	.....	.....	.....	.....	.....	D. C.	600	67
68	15	15	.....	.....	55	55	1,500 feet.....	Holland.....	.....	.....	D. C.	600 city line; 1,200 int.	68
69	25	25	.....	.....	50	.....	.....	Yes.....	.....	.....	D. C.	600	69
70	9	7–9	12	.....	12–15	.....	135 feet about...	Yes.....	.....	.....	D. C.	600	70
71	20	20	25	25	35	35	150 feet about..	Yes.....	.....	.....	D. C.	600	71
72	10.17	10.20	30	30	45	45	800 feet.....	Yes, city and sub.	Yes, int.....	.....	Both.	6600 and 600	72
73	.....	9	12	.....	16	.....	.....	Yes.....	.....	.....	D. C.	600	73
74	30	30	30	.....	.....	.....	300 feet.....	Yes.....	.....	.....	D. C.	600	74
75	12	12	30	30	40	40	600 feet.....	Yes.....	.....	.....	D. C.	500–600	75

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COMPILATION OF DATA COLLECTED BY THE JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS — Continued
Data Sheet No. 90 — April 24, 1912

Key No.	System of Signaling now used			Remote Control or Dispatcher's		Manual Block			Are signals in use experimental	Key No.
	Continuous track circuit	Short track circuit	Trolley contactors	Signals over telephone wires	Over separate wires	Station operators	Staff tokens	Lamps operated by crews		
1	None	None	On a section of ¼ mile in length							1
2			19 sets of three makes		Stromberg-Carlson on separate wire.	None	None	None	Yes	2
3	*		*	*					No, except one controlled by 'phone wire.	3
5	Do not use automatic signals.									5
6			*					*	Yes	6
7									No	7
8	*		*						No	8
9										9
10	No signals									10
11			*						No	11
12	*								No	12
13								*	No	13
14	No automatic signals in use.		None	None	None	None	None	None		14
15								*	No	15
16	None	We have very little single track, not enough to affect our chedules.		We operate cars by separate phone system, but no signals.						16

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COMPILATION OF DATA COLLECTED BY JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS — Continued

Key No.	System of Signaling now used			Remote Control or Dispatcher's		Manual Block			Are signals in use experimental	Key No.
	Continuous track circuit	Trolley circuit	Short track contactors	Signals over telephone wires	Over separate wires	Station operators	Staff tokens	Lamps operated		
17	We have no automatic signal device in operation			.....	.....	.....	.....	.....	.....	17
18	.....	.....	.....	.....	.....	.....	.....	*	No.....	18
19	.....	.....	*	.....	.....	.....	.....	.....	No.....	19
20	None.....	.....	.....	None.....	None.....	None.....	None.....	.....	.....	20
21	.....	.....	*	.....	*	.....	.....	.....	Yes.....	21
22	.....	.....	.....	.....	.....	.....	.....	*	Yes.....	22
23	.....	.....	.....	.....	.....	.....	.....	.....	No.....	23
24	None.....	None.....	None.....	*	.....	None.....	.....	.....	.....	24
25	.....	.....	*	.....	.....	.....	.....	.....	No.....	25
26	*.....	.....	*	.....	*	.....	.....	.....	No.....	26
27	.....	.....	.....	.....	*Telegraph Signal Co., Rochester, N. Y., Dispatcher's signals.)	*At sub-stations and ticket agencies.	.....	.....	No.....	27
28	None.....	None.....	None.....	None.....	None.....	None.....	None.....	Two blocks at special locations.	No.....	28
29	None.....	None.....	None.....	None.....	None.....	None.....	None.....	None.....	.....	29
30	None.....	.....	.....	None..... (By orders given to train men by telephone.)	.....	.....	.....	.....	.....	30
31	None.....	.....	.....	.....	.....	.....	.....	.....	.....	31
32	.....	.....	*12 U. S. One Nachod automatic.	.....	.....	.....	.....	.....	No.....	32
33	Have no signals	.....	.....	.....	.....	.....	.....	.....	.....	33

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34	.....	.....	.....	.....	.....	.....	Yes.....	.....	No.....	34
35	2 sets—Gen. Ry Company.	General Ry...	11 sets Nachod.	2 lines—one 20 miles; one, 45 miles.	Yes.....	.....	.....	58 sets.....	No.....	35
37	.....	.....	*.....	.....	.....	.....	.....	.....	Yes.....	37
38	None.....	.....	.....	.....	.....	.....	.....	.....	.....	38
39	Yes, only two..	.....	.....	.....	.....	.....	.....	.....	.....	39
40	Dispatchers' telephone at all meeting points....			.....	.....	.....	.....	.....	No.....	40
41	.....	.....	*.....	.....	.....	.....	.....	*.....	No.....	41
44	.....	.....	.....	.....	.....	.....	.....	.....	No.....	44
45	None.....	.....	.....	.....	.....	*.....	.....	.....	Yes.....	45
47	None.....	None.....	None.....	None.....	None.....	.....	.....	8 lamps forming 4 block systems.	No.....	47
48	Operated by telegraphic train orders.....			.....	.....	.....	.....	.....	No.....	48
49	None.....	.....	.....	.....	.....	.....	.....	.....	.....	49
50	.....	.....	.....	.....	.....	.....	.....	Yes.....	No.....	50
52	.....	.....	.....	.....	.....	.....	.....	.....	.....	52
53	.....	.....	10 blocks—3.5 miles.	43.46 miles....	.....	.....	3 blocks—8 miles (flag tokens).	193 blocks....	No.....	53
54	None.....	.....	.....	.....	.....	.....	.....	.....	.....	54
55	*(Suburban lines).	.....	*City lines....	.....	.....	.....	.....	.....	No.....	55
56	.....	.....	.....	.....	.....	.....	*.....	*.....	No.....	56
57	No form of block signals in use on any part of the road.			.....	.....	.....	.....	.....	.....	57
58	.....	.....	.....	.....	.....	.....	.....	*.....	No.....	58
59	All signals A.C. Continuous track circuit..	.....	.....	.....	.....	.....	.....	.....	No.....	59
60	.....	.....	*.....	.....	.....	.....	.....	*.....	No.....	60
61	.....	.....	.....	.....	.....	.....	.....	*.....	No.....	61
62	Installing 16 miles.	.....	.....	.....	.....	.....	.....	.....	Yes.....	62
63	None used.....	.....	.....	.....	.....	.....	.....	.....	.....	63
64	.....	.....	.....	Approx. 15 miles of single track suburban line are so equipped.	.....	.....	.....	.....	Yes.....	64

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COMPILATION OF DATA COLLECTED BY JOINT COMMITTEE ON BLOCK SIGNALS FOR ELECTRIC RAILWAYS — Concluded

Key No.	System of Signaling now used			Remote Control or Dispatcher's		Manual Block			Ar signals in use experimenta	Key No.
	Continuous track circuit	Short track circuit	Trolley contactors	Signals over telephone wires	Over separate wires	Station op. rators	Staff tokens	L ams operated by crews		
65	No system in use.	.....	.....	.....	.....	.....	.....	.....	.....	65
66	.....	.....	.....	.....	.....	.....	.....	One.....	No.....	66
67	9 block automatic.	.....	9 blocks.....	None.....	None.....	.....	.....	Trail lights...	.....	67
68	*	.....	.....	.....	.....	.....	.....	.....	Yes.....	68
69	*With automatic stop.	A. C.....	No.....	.....	Yes.....	No.....	No.....	No.....	No.....	69
70	.....	.....	.....	Ramsey light signal.	.....	.....	.....	The Ramsey lights are operated by crews.	No.....	70
71	.....	.....	*	*	.....	.....	.....	.....	.....	71
72	.....	.....	.....	Interurban...	.....	.....	.....	*Suburban....	.....	72
73	.....	.....	*	.....	.....	.....	.....	Lamps.....	No.....	73
75	.....	.....	*	.....	.....	.....	.....	.....	No.....	75

*Indicates an affirmative answer.

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NUMBER MILES SIGNALS INSTALLED DURING 1911

Key No.	Miles of road	Single track	Double track	Kind	Manufacturer	Cost per signal installed	Cost per block installed	Key No.
2	None							2
3		2.3		A track circuit permissive block with circuit controllers to determine direction of traffic	General Electric Company		$3,192 33	3
6	6.4	6.4		Automatic and Manual Block	U. S. Signal Co	$147 65* 38 71†	$295 30* 79 42	6
7			None					7
8	2.0		2.0	Trolley contactors	U. S. Electric Signal Co		$365	8
	3.1‡		3.1‡	A, C. Continuous track circuit	Union Switch and Signal Co.	$750 00	1,691 00	
12	3	3		Light signals	Union Switch & Signal Co.‡			12
13	None							13
14	None							14
16	None							16
19	½			Type "K"	U. S. Signal Co	$784 07	$784 07	19
21	None			U. S. C–1	U. S. Signal Co	100 00	300 00	21
22	1.91	1.91		Lamps operated by crew	Our own make			22
23	Short stretches of Single — City — Track							23
24		None						24
26	75.4	75.4		Semiphore Style B — Track circuit control	Union Switch & Signal Co	$900 00§	$2,600 00§	26
27	None	None	None					27
28	None							28
29	None							29
30	None							30
32	10	10			Nachod	$350 and 360	$362 and 372	32
34				None				34
35	18	18		Three-General Railway				35
				15–Nachod				
36	(Duplicate)							36
37		½		Trolley contact	Nachod			37
40	None							40
41	20	12	8	Manual block	Own	$12 00	$150 00	41
42		None						42

*U. S. Signal Co. † Manual Blocks made by Bay State Street Railway Co. ‡ Subway § Approximate

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NUMBER MILES SIGNALS INSTALLED DURING 1911—Continued

Key No.	Miles of road	Single track	Double track	Kind	Manufacturer	Cost per signal installed	Cost per block installed	Key No.
44	.....	.....	.....	.....	Nachod signals.....	.....	.....	44
47	2.44.....	2.44.....	.....	.....	Elect. Service Supply Co....	$22.75–$27 75	$139–$175....	47
48	None.....	.....	.....	.....	.....	.....	.....	48
52	.....	.....	.....	.....	.....	.....	.....	52
53	9.00.....	9.00.....	.....	(3.5 mi.) 10 blocks automatic	Electric Ry. Signal Company	$238.66 (automatic).....	$477.33 (automatic).....	53
				(5.5) 12 blocks — hand.....	.....	.....	$90 00 per block; hand signals.	
55	7.40.....	3.55.....	3.85.....	Combination light and Solenoid operated disc — city lines.	United States Elec. Signal Co.	$110 00.....	$450 00.....	55
				Elec. motor Semaphore AC 3 position Model 2A GRS Co. suburban lines,	Gen. Ry. Signal Co.....	300 00.....	623 00.....	
56	None.....	.....	.....	.....	.....	.....	.....	56
58	None.....	.....	.....	.....	.....	.....	.....	58
59	14.....	14.....	.....	A. C. continuous track circuit	Union Switch & Signal Co.	$1,400.00 abt. single track incl, wire, etc,	$2,800.00 (2 signals per block)	59
60	.....	16,950 ft.....	.....	(Liverpool) automatic (Green St.) hand operated	.....	.....	.....	60
64	None.....	.....	.....	.....	.....	.....	.....	64
67	.....	.....	.....	.....	Eureka Automatic Signal Co.	.....	$500 00.....	67
68	None.....	.....	.....	.....	.....	.....	.....	68
69	.....	.....	.....	A. C. automatic semaphore type GRS. 2A.	General Railway Signal Co., Rochester, N. Y.	$1,000 00....	Av. 32 blocks—$1,223 25....	69
	(Complete installation 1910...	.....	.....	.....	.....	.....	.....	
71	30.....	30.....	.....	U. S. type G. 1 semaphore attachment.	U. S. Electric Signal Co.....	225 00 abt...	450 00.....	71
72	None.....	.....	.....	.....	.....	.....	.....	72
73	8.....	8.....	.....	Automatic tookout manual operated.	Nachod Signal Co.....	$185 00.....	$365 00.....	73
75	None.....	None.....	None.....	.....	.....	.....	.....	75

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NUMBER MILES SIGNALS INSTALLED DURING 1911 — Continued

Key No.	Average cost per mile track	Average length of block in feet	Number of miles contemplated installing signals, 1912	Kind to be installed	Do you approve permissive signalling	Use of block signals aided or retarded train movement	Key No.
1	.....	.....	.....	.....	.....	.....	1
2	.....	.....	None.....	.....	Question too broad to answer briefly.	Under our conditions has aided very materially. Practically all single track sections, except fixed meeting points, controlled by automatic signals.	2
3	$1,387 97	.....	One and possibly 19 of double track.	A. C. track circuit spacing signals.	Not except on each section of track where two different lines operate.	Aided as well as safeguarded.....	3
6	*369 12 †148 30	*4,220 ..... †2,840.	.....	.....	.....	.....	6
7	.....	.....	.....	.....	Yes.....	Aided.....	7
8	..... ‡7,610 00	781 double..... 1,923 single. ‡1,500.....	0.25..... ‡1.0.....	U. S. signal (electric). A. C. single rail return type.	Not for our conditions.	Aided by increasing number of trains which can be run with safety.	8
11	.....	.....	.....	.....	Yes.....	We think it has aided the movement of cars and trains.	11
12	.....	About 1½ miles....	None.....	.....	Don't think much of it.	.....	12
13	.....	.....	None.....	.....	Yes.....	No experience.....	13
14	.....	.....	None.....	.....	.....	.....	14
15	.....	.....	.....	.....	Yes; when governed by train order.	Aided.....	15
16	.....	.....	None.....	.....	.....	.....	16
18	.....	.....	.....	.....	.....	Aided.....	18
19	.....	2,640.....	None.....	.....	No.....	Aided.....	19
21	150 00	12,000.....	None.....	.....	No.....	.....	21
22	.....	.....	None.....	.....	Yes.....	Aided.....	22
23	.....	.....	.....	.....	For slow operation, yes.	Aided.....	23
24	.....	.....	0.75.....	Automatic block...	Yes.....	No experience, but anticipate that it will expedite movement under our conditions.	24

* United States Signal Company. † Bay State Street Railway Co. ‡ Subway.

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NUMBER MILES SIGNALS INSTALLED DURING 1911 — Concluded

Key No.	Average cost per mile track	Average length of block in feet	Number of miles contemplated installing signals, 1912	Kind to be installed	Do you approve permissive signalling	Use of block signals aided or retarded train movement	Key No.
26	$1,800 00	10,500	11	Semaphore, style B, track circuit control.	Not on single track.	Aided	26
27			18	Automatic continuous track circuit.	Yes	Aided, if dispatchers' signals are working properly. If not, retarded.	27
28			None		We make use of signals compulsory.	Aided very much	28
29			None		No	No experience	29
30			Don't know	Have not decided.		Will be of great benefit and aid if a good signal can be had. Am waiting for a perfect working signal to come out.	30
31			None				31
32	471 80		3	Nachod automatic.	Yes	Aided	32
34			None		No		34
35		Nachod ½, Gen. Ry. 1¼ miles.	37	General railway	No	Aided	35
37		¼ mile			Yes		37
40			None				40
41	80 00	10,000	4	Manual block		Aided	41
42			None			Have no block signals	42
46			None				46
47	118 80	3,475	None			Aided	47
50					No		50
53	†1,363 80	1,848				Aided	53
55	*873 00 ‡6,077 00	500 (Suburban).	5.46	Elec. motor, semaphore A. C. (1.58 miles) & combination light and solenoid operated disc. (3.88 miles).	Yes; so far as our traffic conditions are concerned.	Aided. Key Route Pier most densely signaled piece of track in the world — 3 miles D. T. — 76 signal locations (3 per upper guard A. C.).	55

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56	.....	.....	.....	.....	No.....	Aided materially.....	56
58	.....	.....	None.....	.....	Yes.....	No experience.....	58
59	1,000 00	1,500.....	None.....	.....	No.....	Generally speaking, signals are only to regulate movements, but on double track, aid in movement of traffic by permitting closer headway with greater safety.	59
60	.....	.....	.....	.....	.....	Aided.....	60
61	.....	.....	.....	.....	.....	Has retarded, but consider this as more than overbalanced by the factor of safety.	61
62	.....	.....	16.....	Gen. Ry. Signal Co. Continuous circuit.	Yes; for following trains.	.....	62
64	.....	.....	None.....	.....	.....	.....	64
65	.....	.....	None.....	.....	.....	Both results have been observed.....	65
66	.....	.....	.....	.....	.....	Aided.....	66
68	.....	.....	14.....	Undecided.....	Conditions would govern.	No block signals on this property as yet.....	68
69	1,779 30	.....	None.....	.....	No.....	Aided, and has increased the efficiency of operating crews to practically 100 per cent. All signals equipped with automatic stop brake attachment. All motor cars equipped with Willson-Wright automatic train arrester.	69
70	.....	.....	.....	.....	.....	Yes; our signals do aid, in fact do not think we could operate without them now.	70
71	225 00	2,700.....	.....	V. S. type G; 1 semaphore attachment.	.....	Aided.....	71
73	.....	4,000.....	36.....	20 miles with Nachod, 16 miles U. S.	.....	Aided.....	73
75	.....	.....	12.....	Nachod.....	Yes.....	Aided.....	75

* United States Electric Co. signals. † For Electric Railway Signal Co. ‡ General Railway Signal Co. signals.

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Discussion of the Report of the Committee on Block Signals for Electric Railways

MR. WALDRON:—The five recommendations on page 115 are set forth for the consideration of next year's Committee. I will say, in connection with our report, under the heading of "Digest of Block Signal Laws and Rulings" it is said that the State of Wisconsin has no laws bearing on this subject, but it appears that the reply to Mr. Conn's letter concerning this was not thoroughly understood; and there should have been included in this Digest of Block Signal Laws and Rulings, the following ruling of the Railroad Commission of the State of Wisconsin:

> Safety devices; block signals; Sec. 1797-a. It shall be the duty of every railroad to adopt reasonably adequate safety measures and install, co-operate and maintain reasonably adequate safety devices for the protection of life and property. If, after investigation, the Commission shall determine that public safety requires the installation, operation and maintenance of a block system or other safety device or measure by any railroad, the Commission may, after notice and hearing as provided in Section 1797-12, order such railroad to install, operate, and maintain a block system or other safety device or measure as may be necessary to render the operation of such railroad reasonably safe. (Ch. 297, 1911.)
>
> The word "railroad" as used in this law applies to all classes of roads whether using steam or electric power, and, therefore, Wisconsin does have a law which gives its Railroad Commission authority to investigate the conditions on any road, and while no action has as yet been taken by the Commission relative to interurban lines, it is possible that some action will be taken in the near future.

Your Committee would like the representatives of member companies to enter into this discussion.

MR. NICHOLL:—I cannot say that I am very familiar with block signal operation. We have recently installed, however, on our lines nine blocks of a type fully described in this report, and manufactured by the General Railway Signal Company. We have had them in operation for the last ten days only, but during that time they have worked splendidly, I believe only two failures having occurred. These failures were of a nature that could hardly be avoided for new installation. We find that our men take very nicely to the use

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of the block signaling system. They did not have a great deal of instruction on the subject, but the operation of the system seemed to be so simple that they all learned it very quickly and well. We were unable to find any book of rules which exactly filled the condition of these signals, but in conjunction with representatives of the signal company we formulated our own rules. These rules were given to the men just a few days in advance of the placing of the signals in effect. We had an instruction car, which was accompanied by our signal maintainer and an engineer of the signal company and we took all of our men over the road only two or three times and instructed them in the use of the signals and they seemed to be very apt and learned very readily. We have not had the signals in operation long enough to know exactly whether or not they will increase the capacity of the track, but hope that they will, as we have been told by people operating block signals that they will increase the capacity of the track probably 25 per cent. At this time we cannot say that we know very much about that, however, I believe that the operation of extra trains is a little more difficult than it was without the signals. It possibly delays the extra trains a little on account of having to keep the immediate block in advance clear for the approaching or scheduled train.

MR. JEFFRIES:— Our signals and those of the Union Traction Company of Indiana, were both installed by the General Railway Signal Company, and are of the same type, excepting that those of the Union Traction Company are arranged for operation in connection with double-end sidings; whereas ours are for stub-end sidings. Our signals were put in operation on August 19th, and have, therefore, been in use a little longer than those of the Union Traction Company. Our records show that from August 21st, to October 2nd, inclusive, there were 25,198 operations of these signals, and out of this number there were but eleven failures. However, four of these failures were due to the signal engineers working on the apparatus, and not due to the signals. Two of the other failures were due to poor adjustments in the switch box, one broken cross-bond, one bad contact relay, one switch instrument open, one ground on the line, and one for causes unknown. Therefore, there were only seven failures in over

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25,000 operations. We believe that with a new installation such as this is, that we will have a better record in the future. The section of track that is blocked is about sixteen miles, consisting of seven curves and six blocks; a very crooked piece of track where cars are operated at high speed, in some places coming down grade at from 65 to 70 miles an hour. It is an exceedingly good location to test out these signals. The operation seems to be similar and the rules that we have adopted are the same as on the line operated by Mr. Nicholl. The men all take to the system readily, and we regard this piece of track as being much safer than before the signals were put in. Experience shows that the lights can be seen about 2,000 feet in broad daylight, with the sun shining. As far as we have gone we are very well satisfied with this block system.

MR. HENRY:— On the question of block signaling, Indiana has had a little experience in getting ready for block signals; as to the use of them our experience is short. I want to stop at this time, if you will allow me, to say a few words about the action of our Railroad Commission and their electrical expert, Mr. Hovey, in connection with this proposition, for the reason that I want to compliment them, and for the additional reason that I think the suggestions I have to make may be worth something to some of you who are now where we were two years ago. Two years ago this fall there had been a number of very bad accidents in the State and the Governor called a conference of representatives of the various interurban companies with the Railroad Commission. As a result of that conference the Governor indicated, and the Commission approved of it, that the interurban companies should seek out such devices in the way of signaling as would meet their needs and yet be within their means. The legislative session following closely, the Railroad Commission asked the passage of a law which would absolutely require the installation of automatic block signals, both for steam and interurban railroads. The interurban roads, carrying out the suggestions made in the Governor's conference, insisted upon an amendment to that bill as it was presented, so as to permit the installation of other than automatic block signals. The

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bill was amended and the law passed, and you will find it in the report of your Committee, now under consideration, on page 111. So that while in the first instance it required an automatic block signal, it has the further provision that the Railroad Commission may, in its judgment, approve any other kind of block signal, or any other signaling system which would reasonably tend to safety in the operation of the road. That law was passed one year ago last January and required that all the roads should be equipped by the first of January, 1912.

Immediately after the conference with the Governor, which I have referred to, the traction people of the State appointed a committee to take up, discuss, examine and report upon the question of block signaling. The Railroad Commission gave to this committee the assistance of Mr. Hovey, its electrical expert. He acted with the committee all the way through, and they took plenty of time at it, because they found this situation. So far as the Indiana interurban roads were concerned, they absolutely could not afford, financially, to install any block signal system then to be had. About $2,300 to $2,500 a mile was absolutely prohibitive. Mr. Hovey worked very industriously on the matter with this committee and finally they brought in a report to the Commission showing that some of the signal companies had agreed to put in some sections of signals for inspection. These have since been put in on the Terre Haute, Indianapolis and Eastern Traction Co., and on the Union Traction Company of Indiana, as referred to by Mr. Jeffries and Mr. Nicholl, at a very much reduced cost from the price which had been named, doing away with the use of semaphores, and using lights instead.

About this time Mr. Simmen, the inventor of the Simmen signal and train dispatching system, had been seeking to make an arrangement with our company for the installation of an experimental section of his signal, and with the approval of Mr. Hovey we made a contract with Mr. Simmen and his associates to put in a section of 18 miles of the Simmen signal system on our line. Both these matters came up before the Committee at the same time. The contract we made with Mr. Simmen and his associates was, that his

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system should be subject to the approval of the Railroad Commission. They were very anxious to try out the system on a high speed line and one that was the most difficult in the State, and they felt if it would operate on a single phase line it would operate on anything. The three contracts came up about the same time, and were made with the consent and approval of the Railroad Commission. We put our installation in first. After it had been in use about three months we appeared before the Railroad Commission with Mr. Hovey, and the Railroad Commission, under the authority given by the statute, approved the Simmen Signal System for our line, and since then the other systems have been approved on the Union Traction Company of Indiana and the Terre Haute, Indianapolis and Eastern Traction Co.

What I want to call your attention to especially is this: Two years ago this question was first taken up in Indiana actively by the conference with the Governor, and over eighteen months ago the legislature passed this drastic law, and the time fixed for the absolute and unqualified installation of all the lines was the first day of January last, and yet we have had three men occupying the public position of railroad commissioners of Indiana and an electrical expert advising them, who were level-headed enough and had enough common sense, to act with us and try to work out the proposition in a living way. I commend their action to you and ask you to see if you cannot do as well with any railroad commission or public utilities commission you have to deal with on the same subject.

The Union Traction Company of Indiana and the Terre Haute, Indianapolis and Eastern Traction Co. have been able to get their installations at practically one-half the cost that they were asked two years ago, and the Simmen signal system which we have installed is a little cheaper than that; so that we feel while we have not gained all that we ought, we have made substantial progress.

Begging your pardon for going outside of the report, I want to say a few things about it. I take it that this report means really recommendations regarding a continuous track circuit automatic block. I do not understand that they mean to

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exclude any investigation or trying out and experimenting with anything else, although the report on the face of it would seem to indicate that. If it does I can not agree with the report; but assuming it means what I think, I do agree with it. I think this Association ought to be congratulated upon the careful work of the Committee on this question.

I suppose, Mr. President, one reason you called on me was to know something about the signal we are installing. I will tell you a little about it. The Simmen signal system is not an automatic block system, but is a system that is controlled from the dispatcher's office. The dispatcher, at his desk, controls signals which the trainmen get. It is done in this way. The dispatcher sits at a desk with keys before him that connect him with a section of third-rail at every passing siding and the cars are equipped with shoes that come in contact with these third-rails at the sidings. We installed them, one at the siding and one 2,000 feet on either side, so that the motorman would get the warning to stop or the go ahead signal 2,000 feet before he reached the siding, which with us is about as short as we can count on stopping, because we run fast schedules on our road. If the dispatcher wants to give the motorman a green light in his cab, he simply turns the switch so that he energizes the third-rail, and when the shoe on the car strikes the third-rail, it completes a circuit in the car, giving him a green light, which is held by a storage battery circuit operated by a relay actuated by the original circuit from the energized third-rail. If, on the contrary, the dispatcher wishes to give the motorman a red light he turns the switch in such manner that it does not energize the third-rail, and now when the shoe strikes the third-rail, it simply cuts in a circuit through the red light with the storage battery, and the motorman has a red light right before his eyes. That is all there is of it at that end.

In addition, there is in the dispatcher's office, a sheet, illustrated in the report on page 170, which is moved by clockwork. It is divided into time spaces. The clock ticks, and every five seconds the sheet moves, and the needles which are just above the sheet record the exact time that the car passes over the third-rail at any speed. First, there is the first distant rail;

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second, the home rail; and, third, the far distant rail, so that the dispatcher has before him an absolutely exact record of the time the car passes over each one of the three rails. In addition to this, impelled by the storage battery, another set of needles start up and make a continuous indication which shows the exact movement of the trains and shows how they are all being operated. So that, in addition to the signaling proposition the dispatcher has an absolute record before him of where every train is.

There are some things as we use it, that appeal to us about this system, and the principal one is the fact that the dispatcher knows exactly where the trains are, just what they are doing, and he can arrange meeting points without bringing his trains to a stop. It is believed by those who have looked into it that we will greatly save in operation and can operate more trains than under the old system, in fact, I may say that when we were before the Railroad Commission, after the matter was settled, I said, "Gentlemen, there is one thing I have not mentioned in connection with this matter, and that is, I believe we can operate at least 10 per cent. more trains with the use of this system than we can under the present system." Mr. Hovey, the electrical expert of the Commission said at once, "You will operate 25 per cent. more trains," and I would not be surprised if he was correct.

Another great advantage is that it informs the dispatcher exactly what his trainmen are doing, and where they are, and that is a feature which appeals to us very strongly.

Another thing which appeals to us is the simplicity of the system. There is nothing in the dispatcher's office except what I have described and a simple relay, to keep in order. On the car there is nothing but a relay, the wiring, the storage battery and the lamps. There is nothing between the dispatcher's office and the car except the common wiring and the third-rail to keep in order, except one thing which I am going to describe to you further. From what I have said you will see that it does not require any experts out on the line to keep the system in order and its simplicity is the thing that appeals to us.

We have in connection with the signal system an open-

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switch protector, which is a very good and at the same time a very ingenious affair. It is a common switch protector box, as used by all signaling companies, but it is so arranged that the current over the wire passes through this box, and then to the third-rail, and if the switch is left open the motorman cannot get a green light, because the line is broken by the open switch, but if the switch is closed and the line is perfect the motorman can get a green light, so that even had the dispatcher intended to give the motorman a green light, if the switch is left open, he cannot get it. In fact, a trainman leaving a switch open cannot get more than 2000 ft. away without finding it out and the approaching car is warned 2000 ft. in advance.

One of the great troubles with regard to the proper application of signaling devices is that we are compelled to do things on too small an income. We know that, and have learned it to our sorrow. The great difficulty about the whole signaling business is — we do not want to condemn it, we want everything that tends to safety, that we must have care in these things. We expect to go ahead and develop these matters as offered by the different systems, and we expect everyone interested in the subject will help to secure the best results from all of the systems. I appeal to you, and to all these people who are telling you how to do things, that you labor with them, and see if it is not possible for them to do as well by you as ours have done by us.

MR. WALDRON:— Do I understand you to say you do not approve of recommendation No. 5?

MR. HENRY:— I do not refer to any recommendation by number.

MR. WALDRON:— I understood that you wanted to call attention to the continuous track circuits, particularly, that the amount of money to be expended be directed toward the installation of the continuous track circuit control rather than upon a more expensive indication.

MR. HENRY:— I said I did not approve of the recommendation if you meant to exclude other means of signaling than block signaling. I do not mean to criticise what you say regarding block signaling or continuous track system signaling.

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What the Committee should do, is to recommend that which in its judgment, is the best which they could get and the safest. I have no doubt that is what the Committee is seeking to do.

MR. WALDRON:—As you said, the expenses of installation have been going down decidedly, and the price is now coming within reach of the roads.

MR. HENRY:— I did not expect to go into any discussion of the respective merits of the various systems, and I will not now, but I want to say, that I am thoroughly convinced from the investigation I have made and the experience I have had in these matters, that for interurban purposes the continuous track circuit automatic block signal is not the thing which you want. We have not had any conflict on these matters in our State, and we are not going to have any. We are going to hunt for the things we think are the best. It is just as possible to obtain with the Simmen signal system all the advantages which the continuous rail automatic block affords as it is with the continuous rail automatic block, and the reason why I say I do not think the continuous rail automatic block is the best is because it stops there. Admit, as I believe is correct, that it works perfectly — admit that — but when you have your block shut up that is all you have. No man connected with your road, except your motorman and conductor of the car, knows anything about what they are doing, where they are, or what the cause of the delay is. The system is perfect, but like a great many other perfect things it stops there — it does not do anything else.

In our system what we have in addition to that is an absolute indication on the dispatcher's desk of just what is going on at that place. The application of our system is practically limitless, and the system gives us accurate information of everything which is transpiring out on the road. In the case of the continuous rail, if Mr. Nicholl has a broken bond, it will stop the car, the same as anything else might do, but they do not know what has stopped the car or the reason for the delay, until they investigate and discover it. That is the system — it is a perfect system, but it stops short of giving to the operating force any knowledge of what is transpiring out on the road. That is what we like about our system — we

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know what is going on, and if you will allow me, I want to say that, after all, I have great confidence in man, and I like to have somebody on the road who is charged with the responsibility of directing what is taking place. Automatic systems of all kinds have their places, but they do not think, and you cannot make them think — they look as if they do think sometimes, but then they are like some men, who look as if they are thinking, but really are not. That is what appeals to me — I have great confidence in the human element, and you charge the dispatcher with the responsibility of directing the operation of the road and I have confidence that we will obtain better service out of him. He knows if a man runs ahead of time, or if he loafs on the siding when he ought not to, just how long he is there and all about him. It is one of the greatest features of our system and it is the greatest aid to securing proper disclipine in the force that we have ever found.

This is no criticism of automatic blocks, you understand — I do not want to be drawn into that — they are perfect. The Committee cannot make a stronger recommendation than that. They are perfect, but the automatic blocking system only does so much and no more.

Now as to whether recommendation No. 5 is correct. I object to it, as the question is put by the chairman of the Committee, for the reason that it is no longer the proper practice for interurban roads.

MR. HEGARTY:— On page 118 it says: "On four installations of light signals the electric arc headlights located just above the floor level of cars are found to have no effect on the distinctness of the indication." Arc headlights if they strike the red signal at night, have such an effect on the signal that it does not show red, it shows almost white, and the Interstate Commerce Commission has taken up the subject of arc headlights and has made a voluminous report on the subject. I suggest that the Committee get a copy of the report and study it. There have been several accidents throughout the country on railroads where arc headlights were used, and upon investigating these accidents it was found that the rays from the arc headlight, in striking the red signal, especially

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if the signal light was out, had caused the signal to show white. The Commission is now engaged in a lengthy investigation of this subject of arc headlights.

MR. NICHOLL:—With reference to the arc headlight causing a wrong signal to be shown, or changing the color of the red signal, I will say that we operate most of our headlights from the hood of the car which is 6 or 8 feet higher than the location of the light on the dashboard as used on most electric railroads. We find that it does not interfere with the motorman getting the proper signal, or rightly interpreting it, and we find that where the arc strikes the red aspect, that it shows red just faintly, so that if it is supposed to be a green or yellow signal, it would not interfere with the motorman interpreting the correctness of the signal. We do not find that it shows white.

MR. WALDRON:—Did Mr. Hegarty say that the red indication showed white?

MR. HEGARTY:— It does not show exactly white; it is more a dull orange.

MR. WALDRON:—Would not that be safe? White is not used to any extent as a clear indication. A white light displayed where a red light is normally displayed means stop.

MR. HEGARTY:— In the code of signals red means stop. When one of the accidents I referred to occurred, there was a very thorough investigation into the subject as to the effect of arc headlights on red signals, and as a result of the investigation some of the railroads discontinued the use of arc headlights. On our road, when we come to a block signal, we have the men put out the arc headlight so that they can tell what the signal means.

WRITTEN DISCUSSION BY MR. LEISENRING

It has appeared to the writer that when considering the distances at which light signals can be seen some more definite comparison between light signals and semaphores has been needed than has heretofore been given. The fact that a light signal can be seen 1000 ft., 1200 ft. or 1500 ft. means little as an actual comparison between the light and the semaphore signal on electric railroads. The writer believes that with the simple statement that a light signal of a certain type can be

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seen 1200 ft. this type of signal suffers as a consequence, for, as is only natural, the mind at once reverts to the well-known semaphore on steam railroads that can be seen on a clear day for possibly a mile. The physical conditions, however, surrounding the semaphore signal on the average electric line reduce the distances at which this type of signal is visible.

The writer has made some tests recently, comparing the light with the semaphore signal under the same conditions, with results as follows:

A standard semaphore signal, as adopted by the company with which the writer is connected, indicating in the upper left-hand quadrant, was placed on a long tangent running almost directly east and west. A light signal with 5-in. lenses, two 24-watt tungsten lamps behind each lens, with a 30-in. straight hood and a collar of about 10 in. for forming a background, was located near the semaphore, the green lens being above the red. The background was of the ordinary type encountered on interurban railways, trees being the main formation of the one in question. The poles on the side of the track on which the signals were placed are 8 ft. from the center line of the track. Construction is mast-arm, and the trolley is 18 ft. 6 in. from the top of the rail.

At 7:05 a. m. on the morning of Oct. 5, a bright clear morning with a slight haze near the ground, looking directly into the sun, it being slightly off to the right-hand side, the side of the pole toward the observer being in the shadow, the limit of sight of the green light in the signal above described was 2050 ft. and the limit of sight of the red was 1850 ft. The whole front of the signal was entirely in the shadow. This seems to disprove the idea that the green indication is the hardest to see under all conditions.

The semaphore signal, under the same conditions of light as stated above, could be seen in the 'stop' position, horizontal, distinctly 1500 ft.; in the 60 deg. position, which is 'proceed' on the road in question, it was clearly discernible 840 ft.; in the 90 deg., vertical position, which would be the 'proceed' indication in three-position signaling, it was clearly discernible 750 ft.

At 10:30 a. m. with the sun high and short shadows almost at right angles to the track, the side of poles toward the observer being still in the shadow, the limit of sight of the green light in the light signal was 2000 ft.; the limit of sight of the red indication was 1700 ft.

The semaphore signal was clearly discernible in the horizontal position, under same light conditions as above, about 2500 ft.; in the 60 deg. 'proceed' position about 1500 ft., and in the 90 deg. 'proceed' position about 1450 ft.

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At 3:30 p. m., with the sun shining directly into signal at slight angle, both lenses being in the shadow, the sides of the poles toward the observer being in the sunlight, the limit of sight of the green indication was 1650 ft. and the limit of sight of the red indication was 1122 ft. The direct sun's rays were on the front of the signal, just to the edge of the red, or lower, lens.

The semaphore signal under similar conditions in the horizontal position could be seen for 3645 ft.; in the 60 deg. position for 2500 ft., and in the 90 deg. position for about 2000 ft.

At 5 p. m., when the sun was beginning to weaken and when its rays were directly on the lenses of the light signal, the green indication was discernible for 3000 ft. and the red indication for 1350 ft. The semaphore signal was practically the same as stated in the last previous observation.

The writer has confined himself entirely to limit of sight and has not considered the point of arrestive indication, as to his mind this varies largely according to the ideas of the observer. It appears to the writer that the actual distance in which a larger type of light signal can be seen does not vary greatly from those given above for the small signal. A larger signal, with more light behind it, will, however, give a more pronounced or arrestive indication after coming within the sighting distance.

It is not the idea of writer to disprove the general idea that the semaphore signal is the best all-around signal for all classes of work, for this is his firm conviction, but simply to show that with even a small light signal adequate indication can be given for average speeds as the temporary arrangement, or for use as distant signals, in this way allowing a road to secure track-circuit control at the beginning and perfect the signal indications later.

MR. HENRY:—In our section of the country we have done away with white for safety, and use green. Under our rules of operation, if you saw white it would mean the same as red. I would ask Mr. Hovey, if he is in the room, if it is not a fact, from his knowledge of these investigations that on systems such as the Union Traction Company of Indiana, if there is not less reflection from the lights of that signal system than there is in the ordinary light on the semaphore system.

MR. HOVEY:—There is a possibility with the semaphore

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signals of getting a false indication. We have just completed some tests with the electric headlight and we find that if the signal lamp is not burning there is a possibility of receiving a dim reflection. It is very easy to tell, however, if the light is properly displayed. If the signal lamp is properly burning it cannot give this false indication, as it only occurs when the signal lamp goes out. If an engineer is careful he can tell that the light is improperly displayed, the reflection being very dim. With the semaphore signal, in nearly every case it is possible to see the position of the arms. In the case of high candle power signal lamps you will not have the same trouble, particularly on interurban roads, because the candle power of the light is so high; trouble from reflection only occurs when the low candle power signal lamps are used.

MR. PALMER:—I had hoped that in the report of the Committee this year there would be some definite recommendations on the first topic which was referred to them for study, namely, "For signaling single track suburban railways for headway between 5 and 30 minutes and speed not exceeding 20 miles per hour." I have not been able to find, so far as I have examined the report, any recommendation, except that the Committee be instructed to continue the study of that topic. There are a good many of us who are operating systems where the question of control by track circuits is impossible. We have to use some kind of a signal which will be controlled by means of overhead wires. Our single track blocks need protection and they have to be protected in some manner by means of a signal operated in the way I indicate. I hoped there would be some recommendation as to standard methods of signal aspects, to which the different signal manufacturing companies might bring all their apparatus in harmony. As it is now, one company puts a signal system on the market that shows one aspect for "Proceed," and another one an entirely different aspect. The chairman reminds me of the cuts which are shown at the top of page 114, but that does not seem to answer my question. Where more than one car is operated on the same schedule, that is, one or more cars following the leading car, every car which enters the block after the leading car should have some indication on the

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signal to show that the car operates the signal and that the car is registered accurately. One of our prominent systems uses for the "Proceed" indication the upright position of the semaphore, and another system uses the 45 deg. angle position of the semaphore. What we would like to have seen is some recommendation for standard aspects for three-position signaling to be used in a somewhat different manner from what the aspects shown are intended to be used.

The discussion further brings out here the two different methods of train control, one by means of a dispatcher at headquarters handling trains, which is a system by itself and has its own uses, and the other is a system of handling the trains by means of signals automatically operated.

MR. WALDRON:—In reference to the Standard aspects it was the intention of the Committee to get aspects which would suit our conditions, not particularly confined to interurban traffic, but for use on lines in cities and towns where track circuits cannot be used but where some method of contact indication must be used to operate the signal. I think you will find with the aspects herein shown that you can work any system which is now in operation.

As for the other question brought up, about the recommendation for single track operation, the Committee did study that carefully, but felt they had not gone far enough to warrant any recommendation at this time. The Committee wanted further views from the member companies in this discussion to-day, and particularly they were anxious to find out the opinion in regard to the aspects.

MR. HOGE:—The company that I have the pleasure of representing has been for the past year and a half building an automatic signal that is controlled by a trolley contactor, operated along somewhat different lines than those described in the discussion here this morning, therefore I think possibly a word in passing would not be out of place. We have a contactor that is entirely different, so far as I know, from any other on the market; our contactor is operated by the spring tension of the trolley pole, raising up the contactor on the wire about 1½ inches or a little less, with no obstruction for the wheel to come into contact with. It makes no differ-

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ence whether the current is on or off the line at the time the trolley passes under the contactor, it immediately shows the condition of the car when the power comes back on the line.

We developed it with a view of meeting the low price that the interurban trolley roads seem to agree is necessary in order to enable them to install signals to meet the requirements of the high speed operations of their cars with a dependable safety system. We have developed one that will operate at a speed as high as 60 to 80 miles an hour. We have that system developed and in actual operation both for spacing signals and interlocking block signals, meeting all the Signal Association requirements of the upper left hand quadrant signal, displaying both semaphore arm and lights at all times. Our block signals are positively interlocking and count any number of cars into and out of the block, and all operated by the same current as that used for the operation of the line without the expense of insulating the track. I think that is a feature which has not been touched on in the report and should be made a part of the record.

PRESIDENT ACKERMAN:—Our time for the consideration of this report is about exhausted. What will you do with the recommendations of the Committee? You will find them at the bottom of page 113 of the report and following.

MR. PALMER:—In view of what the chairman of the Committee has stated with regard to the signal aspects, I should like to inquire if my interpretation of these three-position aspects is correct for use with overhead wires.

MR. WALDRON:—Will you note what the Committee says on that point? Does not that refer to what you have in mind? If the block is already occupied, the car will stop at the signal. If a counting device is used all cars entering the block in the same direction after the first one will do so under a caution signal.

MR. PALMER:—That angular position does not mean that the block is clear?

MR. WALDRON:—It means just what it says in the report.

MR. PALMER:—Then I do not see how these aspects could be harmonious with those of any three-position semaphore which would indicate a clear block to a car approaching.

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When a car approaches a signal, and before it actuates the signal, the semaphore blade has got to be in some position, either showing the block is clear, or that the block is occupied.

MR. WALDRON:—Immediately above "Proceed-with-caution" it shows the clear block. Under "Proceed-with-caution," means are provided for taking care of the second car, at those points you have spoken of.

MR. PALMER:—Let me ask you, under this interpretation of this rule, what would be the position of the semaphore blade before the signal has been actuated by the car approaching?

MR. WALDRON:—If cars were operating in both directions on the same track, it would be clear.

MR. PALMER:—Let us suppose that on a single track line the block is perfectly clear, and no car on it, and a car is approaching a signal, and wishes to proceed into the block. Now, before that car actuates the overhead contact what should be the position of the semaphore blade?

MR. WALDRON:—That would be danger.

MR. PALMER:—Under our system the block is clear.

MR. WALDRON:—It cannot be clear from both directions.

MR. PALMER:—If there is no car on the block the track would be clear. You can make it that way.

PRESIDENT ACKERMAN:—We will entertain motions to dispose of the recommendations separately. The first recommendation appears on page 113.

MR. W. H. COLLINS:—I move that the first recommendation be adopted. (Motion duly seconded, stated and carried.)

PRESIDENT ACKERMAN:—We will now consider the second recommendation.

MR. RICHEY:—Does that recommendation mean that the Committee does not recommend the light indications? Does it mean they recommend semaphore indications exclusively?

MR. WALDRON:—The Committee has shown a light indication as well as a semaphore indication. They want to make it as general as possible and to suit all conditions.

MR. RICHEY:—I see that is provided in the drawings, but the Committee recommends as Standard practice "Semaphore Signals indicating in three positions in the upper left hand

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quadrant." Are you recommending that we adopt as standard the use of semaphore signals?

MR. WALDRON:—The Committee realizes, and everybody else realizes, that a semaphore signal is the best indication to give. Next to that comes the light signal which is cheaper than the semaphore.

The Committee is anxious to have the railroads use some good, reliable indication, whether semaphore or light, but the Committee could not well recommend what is not the best.

MR. RICHEY:—That is what I want to understand; whether in adopting this recommendation we adopt semaphore signals as the Standard of this Association; which is putting the thing pretty strong when you realize that in some cases the light indications are the best.

MR. HENRY:— Mr. Chairman, I think we might just as well get to Armageddon. I think this report ought not to have any wording which seems to tie this Association down to a continuous track circuit for automatic signals. I think it entirely proper that all of these recommendations, with very little change, be adopted; but that they should be so worded as to show that they mean, "when automatic continuous track circuit signals are used."

In the recommendation which Mr. Richey refers to, I think these words ought to be put in: "Your Committee recommends as 'Standard' practice," in the use of semaphores the following ————. That is, I think it should say that it recommends this use of semaphores when we are using them. Therefore, I move to amend by inserting, after the word "practice" the words "in the use of semaphores."

PRESIDENT ACKERMAN:—There is no motion before the house. I called for a motion to take up the second recommendation, but as yet no motion has been made.

(Mr. Shannahan, President of the Transportation and Traffic Association, now in the Chair.)

MR. HENRY:— Now, the question I want to ask the Committee is, does it intend to limit the second and the third recommendations to semaphores?

MR. WALDRON:—The second recommendation does limit to semaphore signals, but the third does not.

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MR. HENRY:—You intend by this illustration to take care of the lights?

MR. WALDRON:—Yes, sir.

MR. HENRY:—You intend recommendation No. 3 to take care of lights and semaphores?

MR. WALDRON:—That is it exactly. The Committee recommends the best way to consider semaphores but we realize that we must have lights, and we provide for them.

PRESIDENT SHANNAHAN:—To bring this question properly before the house will not some gentleman move to adopt this recommendation?

MR. W. H. COLLINS:—I move that recommendation No. 2 of the Committee be adopted. (The motion is seconded.)

MR. HENRY:—I move that recommendation No. 2 be amended so as to read this way: "Where semaphore signals are used they shall be so arranged as to indicate three positions in the upper left hand quadrant."

PRESIDENT SHANNAHAN:—It is now fairly before the house for discussion. Are you ready for the question on Mr. Henry's amendment?

(A vote was taken on Mr. Henry's amendment and the amendment was carried.)

PRESIDENT SHANNAHAN:—The question now before the house is on Mr. Collins' motion as amended by Mr. Henry.

(On vote Mr. Collins' motion, as amended, was carried.)

MR. WALDRON:—Mr. President, I have lost track to some extent of these proceedings. I would like to have No. 2 as amended read.

The amendment was read by the reporter as follows:

Where semaphore signals are used they shall be so arranged as to indicate three positions in the upper left hand quadrant.

MR. WALDRON:—Mr. Chairman, as a member of this Committee I cannot conscientiously accept the amendment. I believe if the Association were to adopt this amendment it would be doing that which is not best for it to do. I cannot believe that this Association wants to go on record as adopting what is not the best practice.

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MR. HENRY:— Mr. President, I asked the chairman of the Committee before I made the motion, whether he meant by No. 2 to recommend semaphore signals. I could not read it quite that way. He said he did. When he said he did I moved to amend it, so as to make it clear that he didn't. Now, this amendment is not saying anything against semaphore signals; it is simply saying how they are to be used, when they are used. I think that is as far as you are ready to go, and I, therefore, am in favor of the amendment as passed by the Association.

PRESIDENT SHANNAHAN:— Mr. Waldron, if you want to bring it properly before the house you will have to move to reconsider it, otherwise we will have to pass to the next.

MR. WALDRON:—I wish some of the gentlemen in the room would discuss this question.

PRESIDENT SHANNAHAN:—There is no question now before the house. In order that the gentlemen in the room may have a chance to discuss this recommendation the Chair will entertain a motion to adopt.

MR. PALMER:— Mr. Chairman, for the sake of disposing of this question finally, I move that the action just taken in adopting this motion be reconsidered.

MR. HENRY:—I move to lay the motion on the table.

(Motion duly seconded, stated and carried without discussion.)

PRESIDENT SHANNAHAN:—The next is upon recommendation No. 3.

MR. HENRY:—I move that recommendations No. 3 and 4 be adopted.

MR. NACHOD:—With respect to recommendation No. 3. After studying this carefully, I cannot see that any system of indications proposed here is adequate for an intermittent contact system. With semaphores the three most suitable would be:

Proceed: semaphore vertical, green light;
Stop and stay: semaphore horizontal, red light;
Proceed under control: semaphore horizontal, red light, yellow light below same.

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There is no all-semaphore indication proposed for the latter, and such would be very desirable. These three indications could be used for signals with intermittent control, but another is required of an affirmatory nature, to show that a movement or count has been made in the signal relay to protect following trains entering the block; and for this I have suggested that the yellow light below the red be displayed alternately vertical and staggered. The recommendations do not state whether these aspects are intended to cover intermittent contact systems as well as continuous track circuit systems.

PRESIDENT SHANNAHAN:—Is there any further discussion under Mr. Henry's motion?

(Motion duly seconded and carried.)

PRESIDENT SHANNAHAN:—You have now adopted recommendations Nos. 3 and 4. Recommendation No. 5, reading as follows, is next:

"5. Your Committee recommends, for high-speed interurban service, that automatic signals be controlled by the use of continuous track circuits, and that expenditures be concentrated on continuous track circuit control with a cheaper form of indication in preference to a more expensive form of signal and a less reliable control."

MR. HENRY:—Do you want a formal motion to adopt it before we amend?

PRESIDENT SHANNAHAN:—Yes, there must be. Will some gentleman move its adoption?

MR. HENRY:—I will move its adoption and move to amend afterwards. I move to amend No. 5 to read as follows: Strike out, in the second line the word "that"—the first word of the second line—and the word "be" after the word "signals," and in the third line the word "and" after the word "circuits." I do not object to that for high speed interurban service, except it is useless. Now, Mr. Chairman, my object in making the motion to amend is to limit this recommendation to automatic signals, controlled by the use of continuous circuits and not leave it so that it inferentially recommends automatic signals for continuous track circuits as against everything else. In other words, the recommendation is that expenditures be concentrated on continuous track

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circuits with cheaper indications. I have no objection to that except I do not like to see it exclude everything else and recommend this.

MR. WALDRON:—Your Committee recommended that which it believed to be the best. It recommended this for the reason that most of the members of the Committee have been connected with signal work covering a considerable length of time. During this time they have seen roads spend a large amount of money in installing signaling systems which did not use the continuous track circuits and after a few years discard such systems as not being satisfactory, and then spend other sums of money installing continuous track circuit systems. Your Committee having in mind the large sums of money which have been wasted on unsafe signaling systems believed it was its duty to recommend for high-speed interurban service that which it believed in the end would be cheaper and better than any other known system. For that reason the Committee recommended No. 5, and as one member of the Committee I would seriously object to having that recommendation changed. I would rather see it stricken out entirely.

MR. HEGARTY:—As I read this recommendation the inference is that if automatic signals are to be used, they should be controlled by continuous track circuits, and, further, if automatic signals are used, that the expenditure be concentrated upon the track circuit rather than upon the form of indication. I believe if you look at it in that light recommendation No. 5 would possibly suit Mr. Henry.

MR. HENRY:— Mr. Chairman, I am not hard to suit; I am no stickler on words, but we must take the construction of the chairman on this recommendation as stated by the Committee. I think what he means to do — and he frankly says it, is to recommend as the best practice for this kind of road an automatic signal controlled only by the use of continuous track circuits. That is what he says is meant. The recommendation, however, is that the efforts be centered upon obtaining a cheaper form of indication. I have not any objection to that part of it, but if it is to be construed as the chairman construes it, that No. 5 recommends automatic signals controlled by the use of continuous track circuits against all

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other signals, I am opposed to it, and I have, therefore, asked that it be amended so as not to hurt the recommendation but to take out the inference which the chairman reads into it. We ought to be perfectly frank here without criticising the Committee, and I think if it meant to say that it recommended continuous track circuits that it should have said so. However, it is mixed in with other recommendations and I want to leave the recommendation, but let it read that the Committee recommends that expenditures for automatic signals where controlled by the use of continuous track circuits, be concentrated on continuous track circuit control, etc.

SECRETARY LITCHFIELD:—To insure the correctness of the printed proceedings, I would like to ask just what is meant?

MR. WALDRON:—The Committee recommends, for high speed interurban service that automatic signals be controlled by continuous track circuits. The recommendation does not say, that for all interurban service you must use continuous track circuits and automatic signals. As the recommendation is worded, there is evidently some difficulty as to understanding it. I thought that what was said here recommended for high speed interurban service, where automatic signals are used, that those signals be controlled by continuous track circuits.

MR. HENRY:—If the gentleman will make an amendment to that effect I will second it.

MR. WALDRON:—We want to see whether this wording does not bring that out. It seems to me it does.

MR. PALMER:—If I can interpret this recommendation as it is written it means this, that automatic signals in use on high speed interurban service shall not be controlled in any other manner than by continuous track circuits: "Your Committee recommends for high speed interurban service, that automatic signals be controlled by the use of continuous track circuits." I want to protest against confining the method of operation of automatic signals to a continuous track circuit. It is going to shut out any other method of operation entirely and if we go on record in this matter it will confine our use of signals to those controlled by continuous track circuits.

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PRESIDENT SHANNAHAN:— I will ask the Secretary to read that again.

(The Secretary read the amended recommendation No. 5 as follows: Your Committee recommends for high speed interurban service automatic signals controlled by the use of continuous track circuits, that expenditures be concentrated on continuous track circuit control with a cheaper form of indication in preference to a more expensive form of signal and a less reliable control.)

MR. FRANKLIN:—I may be a little bit dense, but it seems to me the intention of the Committee was to recommend that where automatic block signals are used they should be controlled by track circuit. If I understand the amendment proper, the amendment permits the use of automatic signals that are not controlled by track circuits. If that is so the amendment is exactly opposite to what the Committee recommends.

PRESIDENT SHANNAHAN:—The question is on Mr. Henry's amendment.

MR. PALMER:—As I understand it, Mr. Henry's amendment is as Mr. Litchfield has just read it.

MR. HENRY:—It is.

MR. PALMER:—I move that the amendment be adopted.

MR. BLAKESLEE:—I am not particularly interested in this question but it seems to me it is not a proper thing to pass this amendment, because it is merely words and means nothing as it is now stated. You say where automatic signals are used that they be controlled by the continuous block circuit rather than some cheaper method of control. Now, the idea of that originally was that automatic block signals for high speed interurban service be controlled by continuous track circuits, rather than overhead wires, conduits, etc., and if it be necessary to economize that it be done in the indicators and that the money be spent for the continuous track control. If we pass this we are simply going around in a circle saying nothing. It would look all right to me to adopt that in such form as to allow other signals besides automatic block signals,

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but if we are going to adopt automatic block signals at all for high speed interurban service we want to use a continuous track circuit. Now, either we want to drop this thing altogether, or else recommend the continuous track circuit for high speed service where there are automatic block signals.

MR. PALMER:—I call for the question.

MR. WALDRON:— May I make an amendment?

PRESIDENT SHANNAHAN:—You may.

MR. WALDRON:—I move that recommendation No. 5 be eliminated and referred back to the Committee for further consideration.

(Motion duly seconded.)

MR. HENRY:—There is one good feature in this recommendation: I have had the pleasure of acting with the Committee in our state and I know what these gentlemen have developed in the way of continuous track circuits, automatic block, and this recommendation shows, where you are using the continuous rail automatic block that you should concentrate all of your energies and expenditures on cheapening the devices. We do not see any objection — in fact I think it would be a good thing, that this recommendation should stand, recommending to the Association that they bend their energies to cheapening devices for giving signals. It does not hurt the other proposition in the least. I am not fighting continuous rail automatic propositions. I say this continuous rail proposition is a good one.

MR. PALMER:—I hope that the amendment to the amendment will be voted down. There is a very large and active representation of the member companies here; this matter has had full discussion and I think it ought to be settled now. I hope the amendment to the amendment will be voted on, which will leave us free to accept the motion as originally put, and I think we ought to stand on that; to come right back to the motion as originally amended and have an expression on it.

MR. ROCKWELL:—I would call for the question.

PRESIDENT SHANNAHAN:—The question is on Mr. Waldron's amendment to Mr. Henry's amendment to the effect that recommendation No. 5 go back to the Committee and be eliminated from this report.

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(A vote was taken on Mr. Waldron's amendment, which carried.)

PRESIDENT SHANNAHAN:—The next is recommendation No. 6.

MR. ADAMS:—I move that the sixth recommendation be adopted.

(Motion duly seconded, stated and carried.)

MR. CHOATE:—Now I move that the recommendation be adopted as a whole.

MR. HENRY:—Changing the numbers, of course.

(Motion duly seconded, stated and carried.)

PRESIDENT SHANNAHAN:—The next business before the house is the report of the Joint Committee on Train Operation and the Chair requests the gentlemen to come to the front.

MR. SAWYER:—Mr. Chairman and gentlemen, the Committee's instructions as outlined at the winter meeting, were that we were to consider both city and interurban service. The members of the Committee who have been considering interurban service in connection with train operation, desire to report progress, and the report, therefore, for to-day will be restricted entirely to city service. In order to draw direct financial conclusions which will be comparable for all cases, it was necessary to start in and make several assumptions, which remained the same throughout all cases. I wish you particularly to note that the prices, which in some cases, may be high, and in other cases low; but in all cases we have tried to make them comparable.

In the second part there are very few details that require your attention. This report was written about six months ago and the figures to-day are different from what they were then. As you go through these figures I think that you will find that none of them unduly favor the multiple operation; where favor is shown it tends to help single car operation.

There is a combination of multiple-unit cars which was not shown on the "Direct Financial Conclusions" sheet that appeals to me very much, eradicating to a certain extent the old question of two and four-motor equipments, that is, to use two-motor multiple-unit cars in the summer time all day long,

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putting on the four-motor multiple-unit equipment during the rush hours, thus carrying the bulk of the traffic with the lighter two-motor equipments in the summer time when the track conditions are such that the two-motor equipment will take care of the service.

REPORT OF JOINT COMMITTEE ON TRAIN OPERATION

To the American Electric Railway Transportation and Traffic and the American Electric Railway Engineering Associations:

GENTLEMEN:— The subject of the investigation of train operation was assigned to your Joint Committee by action of the Engineering and Transportation and Traffic Association Executive Committees at their mid-winter meetings, with instructions that the subject be investigated from the standpoints of congested city and interurban service.

The subject of city service has been considered by Messrs. Benedict, Lindall, Jones, Kilbride, Adams and Sawyer, of the Joint Committee and the interurban service has been considered by Messrs. Crume and Stevens.

The Joint Committee has held three meetings; the first at the headquarters of the Association in New York, on January 25, at which were present Messrs. Jones, Kilbride, Benedict, Adams and Sawyer. At this meeting the general outline of the Committee's work was approved.

A second meeting was held at the headquarters of the Association on April 25 and 26, at which were present Messrs. Kilbride, Crume, Benedict, Adams and Sawyer. A comprehensive outline of the report was presented at this meeting and the details of the same were discussed by the Committee.

The third meeting was held at the headquarters of the Association on July 16, at which there were present Messrs. Jones and Kilbride, of the Transportation and Traffic Association and Messrs. Benedict and Adams, of the Engineering Association; in addition Mr. Jackson, of the Public Service Railway Co. of New Jersey, representing Mr. Danforth, and Mr. Gray, of *Electric Traction* and Mr. Kingsley, of the *Electric Railway Journal* also attended this meeting.

PART 1, CITY SERVICE

The report pertaining to city service has been subdivided into two parts — Part 1 gives briefly the essentials, conclusions and recommendations of your Committee, and Part 2 takes up the assumptions and explanations in considerably more detail.

In order to make comparisons of single car operation, multiple-unit operation and trailer car operation, both with two motors and with four motors, your Committee first carefully laid out a schedule and com-

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piled the costs per year on a hundred car basis of (1) Fixed Charges, (2) Platform Expenses, (3) Maintenance and Inspection, (4) Power, for Cars Equipped with 2–55 H.P. and K Control and Operated as Single Cars in Congested City Service. These costs were in the main taken from actual service data and this type of car and equipment is later referred to as A1. After the data on A1 had been compiled, the Committee worked out comparative data and costs for several other combinations of two and four motor single car operation, multiple-unit and trailer operation, upon the following examples, as explained more fully in Part 2.

A2 Two-motor, double end equipments, 55 H. P., with four-motor K controllers and coupler cables between the cars, so that two two-motor cars can be operated in a train. To be operated as single cars, except from 6 to 9 A. M. and from 4 to 6 P. M., when they are operated in two-car trains.

A3 Two-motor, double end equipments, 55 H. P., with multiple-unit control, operated as single cars, except from 6 to 9 A. M. and 4 to 6 P. M., when they are operated in two-car trains.

A3A Two-motor, double end, equipments, 55 H. P., with multiple-unit control. Operated in two-car trains, except from 6 P. M. to 6 A. M., when they are operated as single cars.

A4 Four-motor, double end equipments, 30 H. P., with K control. Operated as single cars all day.

A5 Four-motor, double end equipments, 30 H. P., with multiple-unit control. Operated as single cars, except from 6 to 9 A. M. and 4 to 6 P. M., when they are operated in two-car trains.

A6 Four-motor, double end equipments, 30 H. P., K control. Operated as single cars, except from 6 to 9 A. M. and 4 to 6 P. M., when 53 motor cars are operated as single cars and 26 motor cars in trains with an equal number of trail cars.

A7 Four-motor double end equipments, 37 H. P., K control. Operated as single cars, except from 6 to 9 A. M. and 4 to 6 P. M., when 52 motor cars are operated in trains with an equal number of trail cars.

The important general assumptions for the comparison of the above examples of two car train vs. single car operation are approximately as follows:

Schedule speed 8½ miles per hour for rush hours, except trailer operation, which is taken at 4 and 5 per cent. less, due to less horse power per ton of train.

Rush-hour headway not exceeding 2 minutes for single car operation with 100 cars in operation during rush hours and 50 cars during midday.

Seating capacity of all cars 60.

Car mileage and receipts per car mile the same in all cases.

Fixed charges, covering interest, depreciation, taxes and insurance, 12 per cent.

Platform expenses, 25 cents per hour per man.

Total cost of power at the car $0.0125 per K. W. H.

"Train operation" covers two cars only, in train.

All cars of single, combined entrance and exit type for double end operation and equipped with improved devices for handling passengers and reducing accidents.

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It should be noted that the above conditions were those assumed for the purpose of drawing direct financial conclusions, but by making these assumptions, the Committee is not taking the ground that train operation should be confined to the limits above.

Maintenance and inspection costs were taken as far as possible from records of operating companies, with the exception of the newer apparatus, such as multiple-unit control, this particular item being taken at 50 per cent. more than for corresponding K control. Operating costs which do not vary for the different equipments have not been included. Weights and prices were taken after discussions between the Committee and representatives of manufacturers. Energy consumption and power cost figures were taken mainly from actual tests and the average of a number of the larger power installations. In figuring costs, weights and service, particular attention was given to making all cases directly comparable one with the other.

Based upon the above assumptions and explanations, the following statement shows the financial results per 100 cars per year figured by your Committee for the various cases:

Direct Financial Conclusions Per 100 Cars Per Year.

Class	Type of Equipment and Character of Operation	Fixed charges	Platform expenses	Maintenance and inspection	Power	Total
A1	Two 55 hp. motors, K control, single car operation all day...	$58,968	$192,237	$60,500	$108,716	$420,421
A2	Two 55 hp. motors, K (4 motor) control; single car operation except 6 to 9 A. M. and 4 to 6 P. M. when operated in trains...	64,282	171,884	64,057	108,030	408,253
A3	Two 55 hp. motors, multiple-unit control, single car except 6 to 9 A. M. and 4 to 6 P. M. when operated in trains.....	64,800	171,884	64,430	108,135	409,249
A3A	Two 55 hp. motors, multiple-unit control, train operation except 6 P. M. to 6 A. M.....	64,800	157,828	64,430	105,588	392,646
A4	Four 30 hp. motors, K control single car operation all day....	68,299	192,237	66,902	127,189	454,627
A5	Four 30 hp. motors, multiple-unit control single car operation except 6 to 9 A. M. and 4 to 6 P. M. when operated in trains.....	74,390	171,884	70,832	125,948	443,054
A6	Four 30 hp. motors, K control, single car operation except 6 to 9 A. M. and 4 to 6 P. M. when 53 of the motor cars are operated singly and 26 are operated in train with an equal number of trail cars	64,215	185,615	70,348	120,913	441,091
A7	Four 37 hp. motors, K control, single car operation except 6 to 9 A. M. and 4 to 6 P. M. when 52 motor cars are operated in train with equal number of trail cars.	55,962	178,709	65,165	116,423	416,259

Note.— Statement A (page 238a) gives the general operating data from which the above direct financial conclusions were figured, and the unit car and train schedule tables give all schedule details. This statement and both schedules are attached to Part 2.

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It will be noted from the above statement that where multiple-unit equipment is used and trains operated during the rush hours, the cost of maintenance, fixed charges, platform expenses and power is slightly less than the single car operation with K control, and where multiple-unit is used from 6 A. M. to 6 P. M., there is a decided advantage over the single car operation. The trailer operation, in the comparison of the four-motor equipments, is even cheaper than the multiple-unit operation and shows that where trailers can be used with all of the motor cars during the rush hours the extra cost of the larger motors is more than counterbalanced by the saving due to purchasing less motor cars and more trailers.

The conditions assumed as to cars, equipment, service, etc., are to a certain extent theoretical, and the conclusions are not applicable to all conditions, although your Committee believes that they represent as nearly as possible an average condition covering congested city operation, and for the types of equipments considered are comparative. The two-motor car combinations are submitted to meet operation where equipments of this character may be used, likewise the four-motor combinations cover conditions where they are needed, and the trailer operation still another condition, it being the judgment of your Committee that local conditions must dictate as to the combination to be used and it not being the intention of the Committee to compare two-motor and four-motor equipments.

Indirect Financial Conclusions

In addition to the direct financial conclusions as shown in the statement, your Committee submits the following:

1. The loss of time due to extra or longer stops involved in train operation will be offset by the saving in the reduction of traffic interferences and at car crossing intersections, and the schedule speed will be as high in train service as in single car service, where all cars are equipped with motors of the same size. The above is a general statement based on analysis of service tests covering average conditions of traffic interference and schedules. If the interference from traffic is abnormally high, the schedule speed will be materially increased with train operation, and if abnormally low, it will be decreased due to a greater number of, or longer, stops. Due to the varying local conditions, your Committee did not attempt to capitalize the increase in schedule speed where delays from traffic are abnormally high, but it is apparent that where this condition exists and also on lines or portions of lines where cars are of necessity operated at such close intervals that the efficient track capacity has been exceeded, two-car train operation will be of considerable benefit in increasing schedule speed.

2. The total accident cost will not be increased, and accidents, due to collisions, will be reduced. This statement is based upon the assumption that modern cars and appliances are used, where all entrances and

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exits are protected with doors and the boarding and alighting of passengers is only permitted when the train is stopped.

3. No advantage has been credited to the use of trains for emergency service, such as base ball games, circus day traffic, park and picnic traffic, but it is evident to your Committee that there are a number of occasions each year in the various cities where train operation could be put into service instead of single cars to meet the emergency conditions as to travel in a more satisfactory manner and with increased revenue.

4. Where headways in single car operation are now at a minimum, it is possible to install train service and carry additional passengers with an increased net financial result over and above the results shown in the table. This is due to the fact that train service permits a greater number of cars to be operated over the same given trackage.

General Conditions

The selection of the type of equipment to be used, as stated above, depends upon local conditions. In the four-motor cases the cheaper train, involving the trailer, may not be applicable to all conditions, as the question of grades, character of terminals, minimum headways, density of traffic, etc., may make the operation of the same unsatisfactory, but there are many cities where trailer service could be used at least to a limited extent, with considerable saving over single car operation. In cases of extreme density of traffic, the multiple-unit train is to be preferred over a motor car with trailer, as the interruption of one train may be more serious than under conditions where the traffic is not so dense. The more flexible multiple-unit train, either two or four motor, would warrant its installation in the more extreme congested conditions.

Improvement in the art has made train operation much more practicable to-day than in the past, and in comparing single car and train operation this fact should receive prominent attention and train operation should not be condemned due to past faults either of equipment or operation. The single combined entrance and exit car particularly lends itself to this character of service, and if equipped with doors opened only when the car stops, throws a safe-guard around the operation. The introduction of combination couplers, including the air, has simplified the problem of train operation. The coupler situation is not as satisfactory for city cars as is desirable, but with the improvements now under way train operation should be practical and successful in so far as couplers are concerned.

The air brake equipments of to-day are so designed as to meet the train service satisfactorily, and with the straight air emergency combination, two-car trains are handled with safety. With reference to the use of multiple-unit control, your Committee, after giving this question careful study, believes that multiple-unit apparatus as now manufactured is practicable for city service and the Committee hopes

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that the near future will bring forth further developments in the design of lighter weight and lower cost multiple-unit control equipments.

Recommendation

Your Committee especially desires to recommend, in regard to this city service problem, that the operating officials of city properties give the subject of two-car train operation serious study and attention, as it is the belief of the Committee that a distinct saving is to be made by train operation during certain periods of the day over portions of the system. In recommending this study, they desire to emphasize the fact that it should be made from the standpoint of modern equipment, as they feel that the equipment of to-day has brought about a condition which makes the operation of trains much more attractive than in the past, and that, by the operation of two-car trains in place of single cars, under congested conditions a vastly improved service may be given which can only be considered by the public as an endeavor on the part of the company to better the conditions of the service.

PART 2, CITY SERVICE

This portion of the report covers the same general ground as Part 1, but it is the intention, in this section, to go into the discussion in detail and make the statements more specific rather than general, as they are in Part 1. While in certain cases individual figures may be open for discussion, it has been the endeavor of the Committee to make all figures comparable.

Schedules and Platform Expenses

In order to make definite comparisons of the different classes of service, the Committee had prepared two 24-hour schedule tables: (1) single car operation all day; (2) two-car train multiple-unit operation during the rush hours with single car operation during the rest of the day. These two tables are attached hereto and serve as a basis for all schedule data, as the schedules for multiple-unit operation from 6 A. M. to 6 P. M. for trailer operation and for other combinations were based directly and are comparable to the two tables. The schedule speeds are the same in all cases, except for the train operation involving the use of trailers, which, in the case of the 4–30 H.P. motors (A6), was taken at 5 per cent. slower and with the 4–37 H.P. motors (A7) at 4 per cent. slower. These tables are made out on the basis of 50 car maximum operation, and, in order to meet the conditions assumed by your Committee of 100 cars in maximum service, the tables are to be doubled as to car hours, mileage and costs; thus while the minimum headways are shown as two minutes and four minutes respectively on the unit car table and on the train table, the headways will be respectively one and two minutes on the basis assumed by your Committee. These tables are based upon the assumption that the schedule speeds in these two cases are the same and the average schedule speed

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throughout the day of 24 hours is 8.81 m. p. h. Your Committee decided to use the basis of 100 cars for convenience in figuring, but by so doing they did not intend these figures to be taken as applying to only a "hundred car system," as no specific number of cars have been assumed for the entire system. While headways of one and two minutes are used in the tables, the principle of train operation may be applicable to conditions where headways are even as long as 10 and 15 minutes with train service. In fact, there are instances where train operation is now being used practically and profitably where headways are as much as 10 minutes, and there are many other conditions than those assumed where train operation is practicable.

From the recapitulations on these two tables giving the data as to car hours, car miles, headways, time of runs, etc., it will be noted that the table covering the train operation requires 17 less men than the unit car table. This means 34 men on the 100 car basis. In the case of the train table, the crews have been shifted in such a way as to require that some of the conductors shall, at certain times, assume the duties of motormen, or vice versa. This procedure is not necessary but it is practicable for train operation and by shifting the men in the crews in this manner, the train table would be made up to better advantage for the platform men and also contain fewer short runs. The car hours covering the platform expense as obtained from the tables are the same in all cases, with the exception of the trains where trailers are used, in which case allowances are made to meet the slowing down of the schedules. The rate per hour is assumed at 25 cents per man, which gives a platform expense for the single car per hour of 50 cents and of 75 cents per hour for the train, or 37½ cents per hour for each car in the train on the average. Although the platform wages for these tables cover the exact amount of time as shown upon the tables, the Committee realizes that this is not universal practice, but they consider that for the purposes of this report the expense is comparable. On the unit car table, there are 64 runs averaging 9 hours and 15 minutes, and on the train table there are 57 runs, averaging 9 hours and 20 minutes.

In figuring the number of days per year for the operation of the car, your Committee arbitrarily assumed 325 days in order to reduce the complication in figuring mileage, platform expense, etc., by the year, and is supposed to represent 325 full days of service as applying to the tables assumed.

Car Miles

Car mileage of 33,875 per car per year is assumed to be the same in each case in order to make a true comparison. This is an item which might vary somewhat under actual conditions, but for the purposes of this report and for comparison your Committee has considered it preferable to assume the same mileage for each class of operation and allow the schedule speeds and the car hours to vary.

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Construction Costs and Weights

The weight and first cost figures received careful consideration from your Committee and were only determined after frequent conferences with the manufacturers interested, and after due allowances had been made in both for variations in details of the equipments. The figures submitted are for the complete equipments covering car body and all accessories, trucks, electrical equipment, air brakes and the cost of installation. The basis of all prices is f.o.b. manufacturer's works, having been taken in this manner, in order to eliminate the variable item of the cost of freight. In connection with the prices obtained for car bodies, your Committee investigated the question of the cost of center entrance cars as compared with cars having platforms at both ends, and they received assurances from manufacturers that cars of this type, having the same general principles of design, would cost little, or no more, than cars of the other type, and from the standpoint of weight, there would be practically no increase and very probably a decrease in weight in the case of the center entrance car. In the case of the trail car, owing to the absence of motorman's cabs at each end of the same, it was possible to make the car shorter, keeping the seating capacity the same and allowances were made in both cost and weight to compensate for this fact, allowances were also made for the fact that the trail car would be lighter in the superstructure, as it did not have to carry a trolley. It is assumed, for estimating purposes as to cost and weight, that the car bodies have a steel underframe and wooden superstructure. In the electrical equipments, standard motors with commutating poles are estimated upon having standard insulation. In the car body wiring, semi-conduit insulation is assumed, allowances being made in both the cost and weight figures for even such an item as the variation in the amount of conduit used on the different cars. An allowance of approximately 18 per cent. increase in cost of the two-motor electrical equipment was made for multiple unit over K control. The difference in weight in these cases is approximately 480 lb., showing that the later types of multiple-unit control have been materially reduced in weight from the earlier types. In the air brake equipment, an allowance is made between the single car and the multiple-unit car operation of 200 lb., which is made up of the additional valves, reservoirs, piping, etc., made necessary in this last mentioned equipment.

The car construction cost figures are used only for obtaining the fixed charges, which were arbitrarily taken at 12 per cent. The Committee disclaims any intention of setting 12 per cent. as either correct or incorrect, but has used this figure in each case and the results are therefore very closely comparable.

The figures of weights were obtained for the purposes of the power consumption, and no allowance has been made for the effect of weight in any other part of the operation, such as wear and tear on track, special work, etc.

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Maintenance and Inspection

In obtaining figures for the maintenance and inspection charges, your Committee made a careful study relative to the same, obtaining figures from operation wherever possible, and after establishing a basis, made all other figures comparable. As examples, in car body maintenance allowance is made for the increased cost of maintenance where combined couplers are used in the train operation over single car operation; in truck maintenance an allowance is made between the cost of maintenance of the single motor truck as against the two-motor truck and the motor maintenance allows for the difference between the sizes and service of motors and the number of motors per car. In determining the figures for the cost of maintenance for control and miscellaneous electric, your Committee encountered the greatest difficulty, particularly in the maintenance where multiple-unit control is involved, and after looking over the figures obtained from companies using multiple unit, the Committee came to the conclusion that there was no actual comparable data on which they could base the maintenance figures for this type of control. After a large amount of time was consumed in the discussion of this subject, your Committee decided, in conjunction with representatives of the manufacturers, that an increase of 50 per cent. be made for the maintenance of multiple-unit control over that of K control, these figures applying to congested city service. The manufacturers do not admit that maintenance of multiple-unit control will be 50 per cent. over that of K control, but this is a comparatively small percentage of the total.

The cost of inspection covers the renewal of brushes, cost of lubrication and the expense of inspecting the equipment upon a mileage basis assumed at about 800 miles per equipment.

Items in the operating expenses which are common to all equipments, such as car cleaning, are not included in the maintenance and inspection figures.

Air Brakes

Your Committee has considered that each car would be equipped with air brakes and in the case of the single car equipments with what is known as the straight air type. All of the other equipments are of the straight air emergency type, so arranged that if the coupling on the train parted at any time, the brakes would immediately be set in an emergency position. In the case of two motor cars operated together with multiple-unit control, each car in the train is to be equipped with a motor driven compressor. Where a trailer is used, the motor car alone is equipped with the compressor and the trailer with only such apparatus as is necessary for the service, such as brake cylinder, reservoir, emergency and conductor's valves, etc.

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Passenger Load

The passenger load is assumed at an average of 25 passengers, weighing 140 lb. each. This passenger load is assumed the same in each case and for all the cars.

Power

The energy consumption in kw-hours per ton mile is an item which is, of course, open to considerable discussion. Your Committee appreciated that great variation might be found in figures of this character, and after collecting considerable data from certain known operations and published data, the figures assumed were then checked by representatives of the large manufacturing companies who make a specialty of this work, and they believe that these assumptions are comparative for the different conditions assumed; it must be particularly noted that the figures given for energy consumption are taken at the car. It is, of course, well known that the energy consumption per ton mile for a train is less than for a single car, and the figures illustrate the same.

The cost of power, $0.0125 per kw. hour, is lower than the actual total cost of current at the car for the average city electric railroad and is purposely taken lower in a desire to be conservative and also due to the fact that some of the items entering into the total cost of power are not appreciably affected by comparatively small variations in the amount of power. The total cost of power should take into account operation and maintenance of power house, high tension transmission system, sub-station and low tension distribution system and also fixed charges covering interest, depreciation, taxes and insurance on all of the above items, and cost at the car must take into account all losses between the power house and the car. This total cost of power at the car amounts in extreme cases to over 2 cents per kw. hour, but for the purposes of this report, we believe it fair, as stated above, to use the figure $0.0125. The power costs were taken the same for every hour of the day, although admittedly the cost is less at the non-peak hours and if this fact had been taken into consideration, it would have made a slightly better comparative showing for the heavier motor car (A7) that carries an excess weight in motor capacity over what is needed for non-rush hours when the trailer is not used.

Motor Capacity

For the two-motor equipments it is assumed that 2–55 H.P. 600 volt motors will be sufficient to meet the requirements of the service and that the temperature rises of these motors after all day service terminating in a rush-hour will not exceed 60 degrees C. rise. For the 4–30 H.P. motor equipments, it is assumed that for the single car and the multiple-unit operation these motors would meet the requirements of the service satisfactorily with approximately the same temperature rise

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of 60 degrees C. In the case of these 4-30 H.P. motors used at times to pull a trailer (A6) it is assumed that 53 of the motor cars will be used as single cars and that 26 of the motor cars will haul trail cars during the maximum rush hour period, also that the 26 motor cars used to haul trailers will be taken out of service until the next rush-hour service. On this basis, the temperature rise of the motors on the cars pulling the trailers should not exceed 65 deg. C. rise. With the 4-37 H.P. motor (A7) equipment the temperatures should not exceed 65 deg. C. rise even if used to pull a trailer all day long.

Trailer Operation

The A6 case of 4-30 H.P. motors hauling a trailer during rush-hours only is submitted in this report to show, not so much the advantage of purchasing equipments of this character new for this plan of operation, but to show how it is possible to utilize four-motor equipments, that are now in operation, in conjunction with trail cars, and the Committee has in mind that there are a number of cases where, by the purchase of trail cars alone, additions can be made to the service at an initial expense considerably less than by the purchase of new motor equipments, and in addition, that a saving in operation could be made by the use of equipments of this character rather than by additional four-motor cars. In this A6 case all the motor cars are equipped with couplers and all equipment, so that any of the motor cars can be run pulling a trailer car. If the service was such that the 26 motor cars could be set aside and only used in the trailer service, the remaining 53 motor cars would not need to be equipped with couplers or for train operation and the cost given would then be somewhat reduced. The primary objection to the plan of using motor cars to pull trailer cars where the motors have only sufficient heat capacity to normally run singly all day is that motor cars should never be used to pull trailers except after they have been standing in the barn and are not up to or near maximum temperature. With the motor car equipped to pull a trailer, there is always the possibility of misuse by using the motor car to pull the trailer all day long for emergency service. With motors of only sufficient capacity for the car to run singly, it must be distinctly understood that the Committee makes no definite recommendations regarding this, other than to show that it is a most economical operation if the motor cars are utilized to pull trailers only to the extent assumed by the Committee. The Committee's particular reason for taking this example is that there are to-day many cases where cars are sent out of the barn only for morning and evening rush to handle a factory or shop load which could be more economically handled by trailers as outlined above than by single car operation.

The broader trailer proposition is covered in the A7 equipment, having 4-37 H.P. motors where the motors are of large enough capacity that if need be the car could haul a trailer all day long

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without undue heating, which would cause excessive deterioration of insulation. In this case, the motors and air compressor are both approximately 25 per cent. larger and of course, when trailers are not being hauled, this excessive cost and weight mitigates against the equipment, but, as shown by the figures given in the statement of the Direct Financial Conclusions in Part I, the net result is very economical, and where the service conditions do not demand the more flexible multiple-unit train, this equipment can be used to advantage and should, in the opinion of the Committee, be used much more generally than it is to-day.

To sum up: the 4–30 H.P. motor equipment arranged for using a limited number of trailers during rush-hour only is more economical than the same motor cars used only in single car operation, and is particularly applicable to the handling of shop and factory crowds. If trailer operation is to be taken up, to obtain the full advantage of same, the 4–37 H.P. motor (A7) car arrangement should be used and shows even a more decided gain, due to the fact that in this case the trailers are used to a greater extent.

Another very good combination which is not worked out would be to equip the 4–30 H.P. motor cars with multiple unit and then make up 26 trains of two multiple-unit cars and also 26 trains of one multiple-unit car and a trailer car. This gives a more flexible arrangement than the K control, and an arrangement which costs less money than A5 where the 100 4–30 H.P. motor cars are equipped with multiple-unit control. Trailer cars will consume more time in coupling than multiple-unit cars, but in some instances this saving of time is not of as primary importance as it is in others, and with proper attention to this detail, the time of coupling even in trailer cars can be materially cut down over what is generally assumed as necessary. It should be distinctly understood that wherever the Committee refers to trailer operation it is assumed that the trailer car is equipped with every device for the comfort and safety of passengers that the motor car has. The Committee appreciates that the trailers can be used to advantage without all of these improvements and that some local conditions will justify the further saving which is to be made by rebuilding cars for trailer operation, or possibly in some few cases by making alterations only in present older cars for use as trailers, but we believe it unwise to try to save too much money in this direction, as the full advantage of trailer service may not be secured.

Two-Car Trains Equipped with Total of 6 Motors

Where the trains of two cars, consisting of a 4–37 H.P. motor car (A7) and trailer, will not meet the conditions, and where the use of two four-motor multiple-unit control cars more than meet the conditions, it is possible to operate two cars in the train, one of which is equipped

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with four motors and the other with two motors, and both with multiple-unit control. This makes an equipment which does not cost as much as the two four-motor cars equipped with multiple-unit control, and yet has practically all the flexibility of the last-mentioned equipment. Although this particular case has not been worked out in detail, a fair figure for the cost of operation for the year is obtained by averaging the cost of the third and sixth cases, as shown in the Direct Financial Conclusions. This is a total for this combination of $426,151. This figure shows that an economical combination can be worked out, and in a city where the crowds and service are such as to require a combination such as this, good results can be obtained. During the winter months, when the four-motor equipment may be necessary due to track conditions, the four-motor car can be used singly during the middle of the day and coupled up with the two-motor car during the rush-hours, while in the summer time, when four motors are not necessary, the two-motor equipment can be used during the middle of the day.

Schedule Speed

As previously stated, the schedule speed is assumed the same for multiple-unit operation as for single car operation, always bearing in mind that the equipment and service is the same. At the time of writing this report, train operation has not yet progressed in actual practice to a point which would enable the Committee to secure definite data to prove this point, and even actual tests, under comparable conditions, will only show the results for the particular local conditions of the service. From tests which were made for the purposes of obtaining data for this report, we are unable to quote figures, as there were not enough multiple-unit trains in service to get a fair comparison, and further, the multiple train was new in the service, which always mitigates against obtaining reliable results. From an analysis of these tests, it was apparent, as will be expected, that the number of stops per mile will be slightly increased by train operation, but where the stops per mile are already high, this item, by itself, will not materially decrease the schedule speed. On the tests there were an average of approximately 9½ stops per mile with the single car and 10 with the multiple-unit train.

The length of stop will be slightly greater with train operation than with single car operation, due to the fact that the time for passenger interchange per car will vary for the two different cars of the train due to unequal loading, and that the whole train is held up for the length of time necessary for the passengers to get on or off from the car which has the greatest interchange at that point. This interchange may vary from car to car at different points, but every time both cars are held the maximum time. There will also necessarily be a slight delay due to transmission of signals on the train. The

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education of the public to train operation will cut down the length of stop so that it closely approaches single car operation, and a study of the best method of transmitting signals will make this delay of minor importance.

To offset the increased number of, or length of stops, there is the gain in schedule speed due to the less interruption per car from traffic interference. The maximum schedule speed of a line is dependent upon the maximum schedule speed of the slowest car on that line, and with traffic interference practically cut in half by train operation, the increase in schedule speed from this item alone in the districts with congested traffic will by itself practically offset the loss in number or length of service stops.

The use of two-car trains as against single car will facilitate the movement of cars past congested intersections, as it is possible to materially increase the number of cars passing given intersections by the use of trains. Detail figures showing the gain in schedule speed could, at the best, only be given for particular local conditions, and therefore would not be of general value, but it is most noticeable, without further demonstration, that at the prominent intersections in all of our large cities, two-car trains would materially improve the movement of cars past these intersections. The Committee therefore feels justified in saying, even without the absolute proof and ability to give detailed figures, that, *in general,* the schedule speed will be as high with two-car multiple unit trains as with single car operation.

Multiple-unit equipment and couplers with combined draw-bar, air and electrical connections would make possible the consideration of coupling single cars into trains over the more congested portions of a route, and running as single cars over the remaining portions of the route. When the Committee first took up work on this report, it was not considered practicable for them to assume the coupling of cars together over portions of the route only in this manner, as the problem of designing such a coupler that would be mechanically and electrically satisfactory and still not be too cumbersome was considered to be a very difficult one. However, if such a coupler is developed, enabling cars to be coupled and uncoupled almost automatically, there are many congested points through which the cars could be run more expeditiously as two-car trains than single units and with some further increase in schedule speed — although no saving in platform expense is figured or expected. The Committee sincerely hopes that the coupler manufacturers recognize the need of a satisfactory coupler combining these features.

Although all of the factors referred to above are applicable to trailer operation, the same must naturally result in slower schedule speed than multiple-unit operation. When the Committee assumed 4 per cent. and 5 per cent. slower schedule speed for the two different trailer car equipments, their conclusions were based

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upon the weights of cars and sizes of motors assumed. In some instances trailers are used today with a slowing down of schedule speed of approximately 10 per cent., and even then show a distinct financial gain.

Accidents

As stated in the first part of this report, the Committee does not consider that the accidents would be increased by the use of trains of the type under consideration by the Committee, as compared with single car operation. One large factor which enters into this particular question is that of knock-down and collision accidents and, from the standpoint of per car operated, these would be reduced.

Electric Signaling Device

Where train operation is involved, your Committee has considered an electric signalling device to communicate the signals to the motorman as an essential part of the equipment, as it will be necessary to transmit promptly a signal to stop or start from the rear to the forward car. At the present time, there are several devices of this character upon the market which meet the condition of this service satisfactorily.

General

All the manufacturing companies interested have co-operated with your Committee to the fullest extent possible, several of them sending representatives to our meetings. The member companies whom we have called upon for data have, in every case, given us what they could. To these our thanks are due, but we especially wish to thank Mr. R. E. Danforth, the General Manager of the Public Service Railway Company of New Jersey, and his assistants, for the interest they have shown, the help given and the service data furnished which form the basis of many of the conclusions in this report.

The members of the Committee, who have been considering the interurban service in connection with train operation, desire to report progress and request that they be given more time to study this subject.

Respectfully submitted,

H. H. Adams, *Co-Chairman.*
W. H. Sawyer, *Co-Chairman.*
H. A. Benedict,
John Lindall,
F. J. Stevens,
P. N. Jones,
M. D. Kilbride,
R. A. Crume,
Joint Committee on Train Operation.

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inte- e and ction	Power	Total
,500	$108,716	$420,421
,057	108,030	408,253
,430	108,135	409,249
,430	105,588	392,646
,902	127,189	454,627
,832	125,948	443,054
....	.....	.....
,348	120,913	441,091
....	.....	.....
....	.....	.....
,165	116,423	416,259
....	.....	.....

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Discussion of Report of Committee on Train Operation

MR. ROCKWELL:—I would like to ask Mr. Sawyer if the use of trailers is taken into consideration at dead end terminals.

MR. SAWYER:—The Committee did not take it into account to that extent. We did not provide in our financial column any money for loop terminals.

MR. ROCKWELL:—You also refer to a two-car train. I want to ask whether that is a motor car and a trailer?

MR. SAWYER:—In some cases it is a motor car and in others a trailer.

MR. ROCKWELL:— How does that affect the cost of operation?

MR. SAWYER:—In A-1, A-4 and A-5 cases, the second car was a motor car; in A-6 and A-7 the second car was a trailer car.

MR. ROCKWELL:—You do not recommend the use of trailers at dead end terminals, do you?

MR. SAWYER:— We do not here.

MR. J. Q. BROWN:— I would like to ask Mr. Sawyer whether or not there was any consideration given to equipping trailer cars with control apparatus alone; in other words, operating the motor car by means of control apparatus on the controller.

MR. SAWYER:—There was consideration given to that but the results are not shown in the report. There were so many cases that we could have taken up that we found it necessary to drop consideration of many of them.

MR. J. Q. BROWN:—That would eliminate the loop question entirely.

MR. JOHNSON:—The following table shows the number of passenger cars, both motor and trailer, operated by each of the four elevated railroads of Chicago:

	Metro-politan	North-western	South Side	Oak Park	Total
Motor cars	225	148	370	64	807
Trailer cars	262	200	30	123	615
Total	487	348	400	187	1422

All cars are equipped with multiple-unit control apparatus, the motor cars with the complete equipments and the trailer cars with train line cable and suitable connector receptacles.

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To eliminate some of the objections to trailer car operation, as mentioned by your Committee, and to increase the flexibility of trains both in the yards and on the road all the trailer cars on the South Side and 40 per cent of the trailer cars on the Metropolitan are equipped with motormen's cabs and controlling apparatus so that the train may be controlled from one of these cars just the same as from a motor car. Accordingly many of our trains have a "control coach," as we call it, on the head end during the entire run and many other trains operating into stub terminals have a "control coach" on the head end one trip and a motor car the next trip. This arrangement has worked out entirely satisfactory and we are now starting to equip some of the trailer cars on the Northwestern line with cabs and controlling apparatus.

The trains as operated on the four elevated railroads vary from two to five cars per train, and the proportion of motor cars and trailers in a given size train varies considerably. On the South Side practically all cars are motor cars, as there are only thirty trailers out of 400 cars. This is an ideal condition from an operating standpoint as every car is a self-contained unit capable of taking care of itself. Considering that each car is equipped with the same capacity of motors in horsepower per ton of weight, the acceleration and speed of a five-car train will be just as fast as that of a two-car train.

The motor cars on the Metropolitan, Northwestern and Oak Park are equipped with motors of practically the same capacity, but the number of motor cars per train varies as follows:

	2-car train		3-car train		4-car train		5-car train	
	Composed	Horsepower per ton Lt. Wt.	Composed	Horsepower per ton Lt. Wt.	Composed	Horsepower per ton Lt. Wt.	Composed	Horsepower per ton Lt. Wt.
Metropolitan....	1 M. & 1 T.	6.3	2 M. & 1 T.	7.5	2 M. & 2 T.	6.3	2 M. & 3 T.	5.4
Northwestern...	1 M. & 1 T.	6.3	1 M. & 2 T.	4.5	2 M. & 2 T.	6.3	2 M. & 3 T.	5.4
			or					
			2 M. & 1 T.	7.5				
Oak Park.....	1 M. & 1 T.	6.3	1 M. & 2 T.	4.5	1 M. & 3 T.	4.0		
					or			
					2 M. & 2 T.	6.7		

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From the above table we see that the motor capacity in horsepower per ton of train in the case of the three-car trains on the Metropolitan is 87½ per cent greater than in the case of the four-car Oak Park train with one motor car. With the equipments protected by a current limiting device the acceleration of the five-car Metropolitan and Northwestern trains and four-car Oak Park trains with one motor car is slower than the acceleration of the shorter trains which are operated during the non-rush hour periods.

Your Committee says that the selection of the type of equipment to be used depends upon local conditions. The cheaper train involving the trailer may not be applicable to all conditions, and the more flexible multiple-unit train would warrant its installation in the more extreme congested conditions. A study of the operating conditions on the elevated railroads of Chicago discloses a heavy, but short rush-hour period morning and evening which demands approximately four times the amount of equipment used during the middle of the day. Under these conditions the heavy investment and higher maintenance cost for all motor cars is not considered justifiable. On the other hand with the locomotive system and trains varying from two to five cars in length, the movement of trains is considerably slowed up during the rush hours at the very time it is desirable to get them over the road as quickly as possible. After a careful study of the operating conditions on the elevated railroads as they exist to-day, we believe that a combination of approximately equal numbers of motor cars and trailer cars equipped with cabs and controlling apparatus is the most economical and satisfactory.

MR. MCMILLAN:—The remarks of the gentleman seem to agree with our experience in Los Angeles. The plan he has stated is the plan that we have been following a good many years and we have found it very flexible and profitable.

MR. J. Q. BROWN:—I would also like to remark that we have been operating train service in that way about nine years. The rating of motors in a train is about as follows: At no time shall a train be made up of less than 12 hp. per ton. We operate trains from two to ten cars each and 575 trains a day in and out of one terminal. Every twenty minutes we

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have a headway out of that terminal of about three-quarters of a minute, which connects with a line of steamers from San Francisco. That service, having control cars wired with all control apparatus, has proven absolutely satisfactory and very economical. It gives a flexibility in making up the trains that you can not obtain in any other possible way. It certainly should be included in the recommendations.

MR. ADAMS:—The last portion of this report pertains to city operation, particularly to two-car trains. The members of the Committee, who were to deal with the interurban side of it, have not reported; so we can confine this discussion to two-car trains and in congested city operation.

MR. MCMILLAN:—I would like to say for the gentleman's information it does not make any difference if it is city or interurban operation; the trains can run in the streets of the city the same as out in the country.

MR. J. Q. BROWN:— If we operate on a 45-second headway it makes no difference whether it is city or interurban service.

MR. ROCKWELL:—I want to ask whether it makes any difference in the leverage of the brakes, as between the trailer car and the motor car, which is much heavier, and whether or not it is not advisable to have a trailer car between the motor cars.

MR. JOHNSON:— We operate the trailer cars in any position of the train which may be the most convenient in making up trains in the yards. The trailer cars are braked with practically the same percentage as the motor cars. Practically all our motor cars have two motor equipments. In the majority of cars the two motors are on one truck. In that case the motor truck is braked up to a higher percentage than the trailer truck but the average percentage of the motor car is about the same as the trailer car.

MR. CRECELIUS:—In the operation of a double equipment, with the motor car in front and the trailer in the rear, considerable time is lost because of slowing the schedules. I wonder if that factor enters into the cost as given here.

MR. ADAMS:— Four to five per cent. slower schedule was taken where trailer cars were used, meaning that we had to have additional cars to take care of the traffic.

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MR. CRECELIUS:—You mean that you had to increase your expense four to five per cent?

MR. ADAMS:—Yes, sir.

MR. BENEDICT:—The Committee confines itself to the study of city service with two-car train operation. Every individual road has to make its own study. You will note that the Committee members let themselves down easy by making the conditions and then saying if the conditions are met, the operation will be as represented. If you assume other conditions, you necessarily obtain different results, and, as stated, it is simply a question of studying your own local conditions. I will say that we have already started to study our local conditions in reference to two-car operation. We have, at the present time, equipped cars with multiple-unit control, both four motors and two motors, with the idea of testing, on our various lines, different traffic conditions, with two four-motor cars, or an eight-motor train, two cars, one with four motors, one with two, making a six-motor train, one with four motors on the one car and a trailer, and another two, with two motors on each car, with the idea of going over each of our lines and studying traffic conditions carefully with the various trains to decide, for obvious reasons, which type of train will fit conditions. With this data, we can determine which is better for all conditions.

MR. CRECELIUS:— Motor car and trail car operation is so important, at the present time, that I wish to have on the record the fact that in order to make it possible to get the schedule loss down to 4 or 5 per cent, a very high degree of maintenance of line voltage is required: the voltage throughout the line must be very high, and very steady. I simply wish to express here that the Committee's recommendation for trailer operation requires close and careful attention to trolley voltage otherwise the loss in schedule will be considerably more than 5 per cent; such has been my experience.

PRESIDENT SHANNAHAN:—Is there any further discussion? It might not be amiss to afford the representatives of some of the big electric companies the opportunity to comment on this report or criticise it if they desire.

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MR. CASE:— Last year Mr. Franklin presented a paper on two-car train operation, with two motors on each car, and controllers large enough to handle the four motors. It is unfortunate that he is not present, as this paper was to be a continuation of that general subject. The manufacturing companies are not in a position to recommend a particular method of operating cars because there are so many different conditions of service. It is perfectly evident, from the opinions expressed here, that there is a great variety, and we stand ready to manufacture anything to suit the conditions put up to us. The ordinary cylinder controller, located on the platform, carries the total current for the motors. Such controllers have been developed to the highest possible standard and are much safer than they were a few years ago. At the same time, there is a remote possibility of a short circuit in the controller or among the wires entering it at the bottom, and this might cause a panic, resulting in injury to passengers. With a multiple unit control, where all heavy current carrying parts are located below the car floor, such a contingency is not possible and the indirect accident expense is eliminated. Of course this Committee has not gone into that subject. Some of the leading roads are now installing multiple-unit control without provision for running two cars in a train.

MR. ADAMS:— We are indebted to Mr. Jackson of the Public Service Railway, for some of the ammunition that is in this report. We would like to hear from him as to how this character of operation has affected their schedules in practice.

MR. JACKSON:— I would like to state, that at the time this test was taken, we only had one train in operation. That was a train of two cars, with two motors under each car. Our schedule speed was not affected to any great extent. A few competent trainmen were broken in to run the train, and when we tried it on the different lines, these trainmen went with the cars, which enabled us to obtain better results. We found later, however, that for the operation of trains it is necessary to have trainmen thoroughly broken in. You are taking a man from a single car, giving him a new control to handle, and in addition to that you are doubling up the cars by having an extra car to handle during the rush hour. If he is not thor-

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oughly trained he will not gauge his stops, and naturally he will not load his cars evenly. We were fortunate as our conditions enabled us to equalize the loading of both cars. In the test we found that taking the two cars together in a train, crossing at an intersection 118 ft. in length, the two-car train would cross over in 20.4 seconds, where it takes a single car an average of 16.9. On a train with 180 passengers, the interchange of passengers is 1.2 seconds per passenger, and on the unit car with 80 passengers is 1.7 seconds per passenger. This is an average record taken for one week. The average stops per mile on the train was 11, on the unit, 10. These stops with train operation were made where the streets in some sections are probably 200 ft. apart. I think the different companies in time, by getting together with the various municipal authorities can establish stops in the rush hours, whereby the schedule speed can be maintained with trains just the same as it can be with a single car, provided both cars are live cars. I do not think trailer operation is a thing that can be worked on all properties.

(On motion, moved and seconded, the report was accepted and placed on file.)

MR. CHOATE:— I believe that the excellent reports presented this morning by the Committees considering the matters of Block Signals and Train Operation deserve something more than passing recognition at our hands and I, therefore, propose that a vote of thanks be extended to the members of both Committees, as well as to the gentlemen who by their discussion of these subjects, have made this meeting so successful.

(Being duly seconded, the motion was unanimously adopted.)

(On motion, duly seconded, the meeting then adjourned.)

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WEDNESDAY MORNING SESSION

OCTOBER 9, 1912

President Shannahan called the meeting to order at 10:15 A. M.

PRESIDENT SHANNAHAN:— The first order of business is the appointment of a Committee on Nominations of the Transportation and Traffic Association. In what manner shall this Committee be appointed or selected?

(It was moved, seconded and carried, that the Chairman appoint the Committee on Nominations.)

PRESIDENT SHANNAHAN:— The next order of business is the report of the Committee on Passenger Traffic, which Mr. J. E. Gibson will present.

REPORT OF THE COMMITTEE ON PASSENGER TRAFFIC

To the American Electric Railway Transportation and Traffic Association:

GENTLEMEN.— Your Committee on Passenger Traffic received instructions from the Executive Committee to consider the matters listed below, namely:

(a) Chartered car tariffs.
(b) Winter resorts.
(c) Summer resorts.
(d) Interline business with steam railroads.
(e) Tourist business.
(f) Distribution of the Peak Load.
(g) Mileage ticket books (unrestricted).
(h) Value of increasing the number of limited cars.
(i) Number of stops for limited cars in towns and cities.
(j) Extra fare cars.

Your Committee at its meeting in January considered the suggested topics and prepared an inquiry form which covered most of the subjects outlined by the Executive Committee. The matters touched upon do not generally admit of definite recommendation and your Committee has therefore decided to present as its report, a resumé of the information collected, feeling that the data is of such a nature as will be useful to the companies and perhaps serve as a guide to improvement in operating conditions and in some cases, point the way to increases in earning power.

CITY OPERATION

CHARTERED CAR TARIFFS

The tables below indicate the methods in use on city and interurban lines with regard to charges and restrictions as to chartered cars.

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Bound Brook	Court House, Somerville	End of line, Raritan	Riverside Park	Penn. Sta. via Main, New Brunswick	Milltown	South river	Sayreville	End of line, South Amboy	Bonhamtown	Main and Amboy, Matrchen	State and Smith, Perth Amboy	South Amboy, via Railway
from the chart the running time in minutes, multiply												
ars and cents.												
0												
22	0											
30	8	0										
10	32	40	0									
45	67	75	35	0								
67	89	97	57	22	0							
90	112	120	80	45	23	0						
97	119	127	87	52	30	7	0					
135	157	165	125	90	68	45	38	0				
67	89	97	57	22	45	67	74	112	0			
75	97	105	65	30	53	75	82	120	8	0		
120	142	150	110	75	98	120	127	165	53	45	0	
178	200	208	188	223	245	268	275	313	245	253	30	0

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ents between divisions the time on each division is obtained and added to form basis of calculation.

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One of the interesting exhibits obtained by the Committee is the chart by the Public Service Company of New Jersey, which is shown complete herewith. It indicates the study that has been made of this matter of car tariffs by this prominent Eastern Company and shows an up-to-date method of arriving at proper charges for service of this kind, and one which, it seems, would tend to show to the customer that he is receiving fair treatment and thus make him more satisfied than he might be under the arbitrary charge method which usually obtains.

CITY LINES

CHARGES FOR AND RESTRICTIONS ON CHARTERED CAR SERVICE

SELECTED LIST

Basis — per car	Charge	Remarks
Per trip.....	$15; round trip, $26.25....	Pay in advance; regular equipment.
Per trip.....	$5; round trip, $8.....	Pay in advance; inspector with car; regular equipment.
Per trip.....	$5, 9 A. M.–4 P. M., 7 P. M.–midnight; $10, 6 A. M.–9 A. M., 4 P. M.–7 P. M.; round trip, $10 and $20, respectively.	Pay in advance; limited to 100 passengers; regular equipment.
Per trip.....	$4–6, one way, and $6–$9, round trip according to seats.	Pay conductor; minimum charge, $10 between 12:00 and 6 A. M.; limited to 10 more than seating capacity; advertise this service; regular equipment used and inspector accompanies car; interchange with other companies and bill for crew, time and mileage. Funeral cars at regular chartered car rates, but not remunerative.
Per trip.....	$5, single truck; $7, motor and trailer; $10, double truck, round trip prices, $7.50, $10.50 and $15, respectively.	Bill responsible people; pilots used on cars; regular equipment; interchange with other companies on basis of $2, small car, $3, motor and trailer, $5, double truck car.
Per hour.....$5,	first hour; $2, every additional hour.	Use regular equipment, also special parlor cars both open and closed; interchange with other companies on basis of 25 cents per car mile.
Per hour.....	$3 per hour, 5 cents per minute.	Passengers limited to 60, making price equivalent to regular ride; pay in advance; pilots used; regular equipment.
Per hour.....	$5 first hour; $3 each succeeding hour.	Rate based on 50 passengers per car; depending on party, bill or require pay in advance.
Per hour.....	$5 first hour; $3 each additional hour.	Pay in advance; regular equipment used; funeral cars operated, minimum charge, $15; maximum, $30; depending on district; this operation remunerative.
Per hour.....	$5 per hour; minimum charge, $20.	Passengers limited to seating capacity; advertise chartered car service; pay in advance; use regular equipment, also specially equipped parlor cars with observation platforms, draped windows, buffet, upholstered rattan chairs. Operate funeral cars and charge trip basis; business remunerative.
Per hour.....	Two-hour rate, $10 and $12, according to car; reduction for round trip.	Extra charge after midnight; pay in advance; regular equipment; also special equipment used. Funeral cars operated; charge, $25 for funeral train, 2 cars; business remunerative.
Per car-mile and per hour.	Per car basis, $10 minimum; $5 for each additional 5-cent zone. Per hour basis, 3 hours, $10.	Advertise in daily papers; reduction made for round trip; pay in advance; regular equipment. Funeral car at chartered car rates; business remunerative.
Per car-mile...	Minimum charge, $10;then up to $30, according to mileage.	Pay inadvance; regular equipment.

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FACTORY CLOSING HOURS

The inquiry of the Committee with regard to the methods employed to spread the morning or evening peaks over a greater period of time by co-operation with factory owners, has developed the fact that little if any effort of this kind has been made. The replies would indicate that the matter has probably not been very seriously considered, but your Committee feels that it is one well worthy the attention of the members and it would seem that if some concerted action was taken, good results might be obtained. If factories, mills or other establishments could be induced to lengthen the reporting times, which would automatically lengthen the closing hours it would necessarily have the effect of reducing the peak requirements at these particular times and doubtless in many cases would permit extra cars to make two or more trips, whereas now a large number of single trip cars may be required. The plan would mean that some of the employees of such establishments would report at 7 o'clock, some at 7:15 and so on, and these employees would conclude their day's work at correspondingly different hours.

As stated above, little information has been obtained, tending to show that the companies have given this matter any considerable thought, and your Committee would respectfully suggest that the matter be brought to the attention of each of the members and the subject be continued for consideration by the 1913 Committee.

CO-OPERATION WITH MANAGERS OF AMUSEMENT RESORTS

Your Committee has made inquiry as to the practice of operating officials with regard to their obtaining before-hand knowledge of the dates of events at amusement resorts, size of crowds expected, size of crowds actually in attendance, time of closing, etc.

It seems that there is more or less general co-operation in this way, and many of the companies indicate that it has resulted in increased traffic. Replies to the query as to whether companies assist in producing attractions at other than railway-owned resorts, has developed the fact that few companies make a practice of sharing such expense. The Committee believes that good results will undoubtedly be obtained by cordial co-operation with the proprietors of resorts along the routes, feeling that in this way increases in gross receipts may be brought about and by thus being enabled to provide for heavy riding, patrons will be satisfied, whereas without advance information inadequate service may be obtained and such riders may easily be turned into unfriendly customers of the operating companies.

PROVISION FOR CONTINUANCE OF STREET CAR SERVICE WHEN INTERRUPTED BY STREET PARADES.

In the replies received there do not seem to be many ordinances effective which affect the operation of cars during parades. It does appear to be the general custom, however, for police departments to regulate this and to give parading bodies the right of way over the

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street cars. The general plans of turn-back, filling in with extra cars, re-routing wherever possible and use of short loops, are the usual and ordinary means of getting back to schedule time after such interferences have ceased.

INTERURBAN OPERATION

INTERURBAN LINES

CHARGES FOR AND RESTRICTIONS ON CHARTERED CAR SERVICE

SELECTED LIST

Basis—per car	Charge	Remarks
Per trip.....	$20 between 6 A. M. and 1 A. M.; one way charge, $14; 1 A. M.–2 A. M., $2.50 per hour; 2 A. M.–6 A. M., $3 per hour.	Limited to seating capacity; party ticket issued.
Per trip.....	$25, 50 passengers; $30, 60 passengers; more than 8 hours, $1 per hour.	No extra charge for standing passengers allow 8 or 10; party ticket issued.
Per seat.....	Guaranted seating capacity of car, regular fare; $5 per hour beginning 12 midnight.	
Per mile.....	One cent per mile per passenger; round trip, minimum, 60 passengers; maximum limit, 62 passengers.	Do not use party ticket; no extra charge for use of car beyond time limit.
Per mile.....	80c. per car-mile, one way; 65 c. per car-mile, round trip; 60 c. per car-mile for added trailers; 50 passengers minimum; extra passengers per capita basis.	Issue party ticket; no extra charge for use of car beyond time limit.
Per mile.....	1½ c. per mile; minimum, 50 tickets; extra passengers pro rata rate.	Individual special car tickets used; when rate less than $15, 6 hours allowed; $15 to $90, 8 hours; over $90, 12 hours; all excess, $1 per hour.
Per mile.....	$2 per mile; limited to seating capacity.	Do not issue party ticket; rate covers 2 hours' layover at any point.
One-way ticket	.....	Limit, 50 passengers to car; minimum regular rate for extra passengers; do not issue party ticket; charge $5 per hour between 1 A. M. and 5 A. M.
One-way ticket	.....	Minimum, 50 passengers; 1½ fare for round trip; extra passengers, charge per capita rate; do not issue party ticket; $5 per hour after 2 A. M.
One-way ticket	.....	Minimum, 40 fares; issue party ticket; no extra charge for use of car beyond time limit.
One-way ticket	.....	40 passengers minimum, with $5 charge for special car service; $20 per mile for return of car; round trip, minimum 40 passengers, and $5 for special car service; 50 passengers maximum; all over that pay regular fare; do not issue party ticket; $2.50 per hour charged after 10 hours' service.
Round trip ticket.	.....	Minimum, 60 round trip fares; 75 passengers allowed; $5 per hour; 11 and 12 P. M.; $10 per hour or fraction thereafter.

EXTRA FARE CARS

Inquiry on the subject of whether extra fare cars are operated, shows that but one company of those reporting charges an additional fare for high speed service and this company makes an arbitrary charge of ten cents regardless of distance. This company further states that

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the cars make better time than the regular running time and that the returns have been excellent and the service instrumental in obtaining increased through business.

FUNERAL CARS

A number of the interurban companies use cars for funeral purposes but in none of the cases reported do companies utilize any special equipment.

COLONIZATION

The Committee hoped that through the inquiry form distributed it could develop a record of the extent to which the electric railway interurban lines are taking up the matter of developing home sites and the location of industrial enterprises along their routes, but information of any considerable value has not been secured.

With regard to special inducements offered to prospective dwellers, there does not seem to be any well defined movement in this direction. The majority of the companies which reply state that absolutely none are offered, and the majority of the companies indicate that the only inducement that seems to be required is "good service." A considerable number of companies offer commutation or other reduced rates of fare, install additional stopping points, and things of like nature.

Efforts to bring about the location of industrial enterprises seem similarly not to have been consistently followed up; in fact, by far the greater number of companies seem to take no interest whatever in such matters. A number of companies, however, have displayed some activity, some of the means employed being as follows:

"One company rents land owned by the company at reasonable rates. Other companies offer their service in securing sites, and when they are determined, provide sidings and establish through rates with steam railroads."

The providing of extra car service at morning and evening hours is, of course, a somewhat natural co-operation, as are provisions for terminal facilities and satisfactory service.

A number of companies specifically call attention to their co-operation with Boards of Trade, Commercial Clubs, and similar civic bodies. Considerable advertising is also carried on by some few of the companies.

A number of the companies report that they work with real estate concerns with an idea of having subdivisions promoted and to assist in this way, build shelters, provide for additional stopping points, and make the best rates possible. The illegality of offering free transportation obviates any concessions in this way, and companies quite generally responded that they do not offer any free lighting as an inducement. Commutation rates are, of course, in more or less general

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use and such transportation makes up, in many cases, a very considerable percentage of the total, as high as 56 per cent. being reported in one case and in another 38 per cent.

Low rates to school children prevail in perhaps 50 per cent. of the cases reported.

Speaking now of freight matters and the extra facilities offered by interurban companies, we find that prompt, good and fast service are the cardinal principles upon which the electric railways stand, the electric delivery providing practically express service with in many cases freight rates. A number of the companies reporting have joint through rates with steam railroads and frequently interchange cars with such connecting lines. Comparison of rates with the steam railroads develops the fact that the electric railway rates are, generally speaking, the same.

Of the companies reporting, it is found that where express and freight traffic is conducted, that there is a fairly even division as between lines in competition with steam railroads and those without such competition.

Inquiry as to whether the companies guarantee to real estate or other interests specific service, develops the fact that but few companies feel justified in making any such guarantees.

As to the operation of theatre trains, or means of taking care of theatre traffic within 25 or 30 miles of large cities, it seems that a number of the companies provide special service for this and many hold the last cars for the accommodation of theatre-goers.

A goodly number of companies, however, do not provide specifically for such travel. It would appear to the Committee that this matter should be given attention by such companies, as it feels that it may be possible to at times develop some extra riding on the late runs.

As to whether any inducements have been offered residents along the interurban lines in the matter of carrying provisions free, the companies quite generally answer that this practice is not followed, though in one or two instances the companies do so. One company reports that for some time it afforded the privilege but that the patrons abused it to such an extent that it became necessary to abandon the plan. The companies are practically a unit in opposing any such free express service.

Referring to the plan whereby merchants in large cities refund railroad fares to purchasers, it is found that in the great majority of communities this practice does not maintain, and the companies usually state that they are not in favor of such arrangements, some of them expressing the thought that it is liable to arouse antagonism on the part of the country merchants. In some cases at least, it appears that the practice is entirely illegal.

The above briefly touches upon matters relating to colonization and

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the Committee hopes the data given herein will prove of some value to the members as illustrating practices in vogue. It feels that this particular subject has perhaps not been given the serious consideration that it should and would recommend that the companies discuss the subject and that the Committee in 1913 further investigate the matter, with a view to presenting to the next Convention some specific recommendations.

CO-OPERATION WITH AMUSEMENT PARKS

There seems to be a more general participation and co-operation on the part of interurban companies with amusement resorts along the line than is the case with city companies. Practically all companies report that they keep in close touch with the proprietors of such amusement parks in order that they may be informed as to special events and size of crowds. The companies say that in this way they feel that they have obtained the good will of the public and are better able to give the service that is demanded which in their judgment brings in increased and profitable receipts. A number of companies contribute to the cost of producing attractions and in this way appear to take exactly the opposite course to that pursued by companies operating city lines alone.

LIMITED CARS AND LIMITED CAR STOPS

Your Committee endeavored, through this inquiry, to ascertain the practice of the companies as to the stops made by limited cars, and the practice maintained is about as follows:

Of the number of companies reporting, only one operates between terminal cities without stops, practically all of them making stops at the intermediate towns, though some pass through the unimportant ones without stop. As to stops within the cities, the replies indicate that on the outbound trips there is a fairly even division as between stops at all city streets on signal and at specific stopping points within the city limits; on the inbound trips the same division maintains, practically one-half of the lines stopping at intersecting streets as required and the other half taking on and letting off passengers at definitely fixed points only. The one company that reports no stops between terminal cities, of course, does not stop to pick up or discharge passengers at other than the terminal stations within the city.

As to the question whether more than one stop is made in intermediate cities, it appears that a number of companies make this one stop only; others, however, have a number of fixed stopping points, still others stop upon signal and one company specifies that it makes not to exceed three stops in any intermediate town, presumably at fixed points.

Responding to the inquiry as to whether limited trains and local trains are alternately scheduled or whether the operation of the

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limited trains is fixed by certain events, as for instance, court openings, steam railroad connections, etc., etc., develops the fact that the majority of the companies are operating alternately as stated; others govern their operation by events such as are indicated above, and some run the limiteds at fixed intervals throughout the day.

In only one case is an extra fare charged on such limited trains, and in this instance the charge is 10 cents regardless of the distance traveled.

As to the proportion of riders traveling on limited and local trains, little information was obtained, though in two instances companies which use the alternate plan for limiteds and locals, report that 60 per cent. of the passengers are carried on the limited trains. Only two of the companies reporting use special equipment on these limited trains.

INTERLINE BUSINESS WITH STEAM RAILROADS

The Committee next considered the matter of interline business with steam railroads and has sought to secure data as to the attitude of both the electric lines and the steam railroads on this point. While the material collected is not entirely comprehensive of the country, it still is such as to give a fair idea of the present situation, and shows that with only a few exceptions the companies which reported feel that from the standpoint of the electric lines, it would be advisable to exchange passenger traffic with steam railroads, particularly if the public desires it. One important company, however, states that such exchange is only advisable where it becomes absolutely necessary. It appears to be equally true that the steam railroad companies, generally speaking, are not favorable to such interchange, though in a few cases they appear to think it desirable.

As to the division of rates, there is a fair division of opinion on the part of the electric lines as to whether rates should be pro rated on a per rate, or on a mileage basis.

Answers to the query "Should the rate be constructed using the sums of the locals to and from steam junction points or by using a short line rate going short route?" show that a number of companies feel that the sum of the locals should be utilized, while a fair percentage feel that the short line rate better suits the purpose.

Analysis of the replies to a question asking whether the interurban railway companies are willing to conform to the long established custom of the steam railroads in the handling of free and excess baggage, shows the majority of the companies approve the custom. The above situation applies also to present plans involving a specific amount of free baggage on each first-class ticket, and the acceptance of similar baggage from steam railroads; some companies state, however, that they are not in position to handle C. O. D. baggage from steam railroads.

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The Committee made inquiry as to what, in the judgment of the members, is the justification for interline arrangements. The majority of the replies received indicate the following sentiments:

That such arrangements extend the boundary of available traffic, that they enlarge the field of business and improve the character of the road, and that it is desirous for the reason that it gives to the electric lines a business which originates on lines foreign to the territory which the electric lines serve; also, that it is a convenience for passengers and thus serves to increase travel; and that there is a demand for such service where interline arrangements are in effect it appears that while in most cases this business covers regular travel, in some fixed instances special excursion business only is involved.

In cases where reduction of fare is made, the Committee asked for data as to what proportion is borne by each company, and the following replies are submitted for the information of the members: Ratio of one-way fare; pro rata per rate; pro rata on mileage; pro rata reduction on rate basis; pro rata reduction on mileage basis.

Concerning the issuance of tickets, whether commutation or single, as to who issues them, and division of costs, the following plans are effective: Division of costs on ratio one-way fare; initial lines issue and pay all costs; expense borne jointly.

As to the proper division of advertising costs as between lines, there is a division of opinion, some companies feeling that the advertising costs should be divided in the ratio of the one-way fare, others that each line should pay for its own advertising, still others that the initial line should bear the expense, and others that where traffic moves in both directions, the initial line should take care of the advertising.

A question as to the arrangement of schedules in regard to connections with steam railroads, solicits the fact that about one-third of the companies reporting make no effort to arrange schedules to make such connections.

As before stated, the above report is submitted merely as a resumé of the practice of the companies on the subjects touched upon. Most of these are such as do not lend themselves to definite recommendation, others that might have been covered in recommendatory form have not been taken care of in this way for the reason that the Committee has not been able to devote to a study of the various points, the time and attention that in its judgment is necessary to properly develop recommended practices for the use of the member companies.

Respectfully submitted,

J. STANLEY MOORE, *Chairman,*
F. G. BUFFE,
J. E. GIBSON,
FRANK CAUM,
N. W. BOLEN,
J. L. ADAMS,
Committee on Passenger Traffic.

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Discussion of Report of Committee on Passenger Traffic

MR. SCHNEIDER:— Under "Funeral Cars" the report says that no cars are operated by interurban lines for that purpose. I wish to state that our Company has operated a funeral car for something like two years or more and it is used exclusively for funeral purposes. It gives a revenue, over and above the regular chartered car rates, of from $1,500 to $2,000 per year. We find it a very good thing and very much sought after.

PRESIDENT SHANNAHAN:—Are there any further suggestions or discussion on this report? If not, the next order of business is the report of the Committee on Express and Freight Traffic. Mr. F. D. Norviel will present the report of this Committee.

REPORT OF THE COMMITTEE ON EXPRESS AND FREIGHT TRAFFIC

To the American Electric Railway Transportation and Traffic Association:

GENTLEMEN:— The Committee on Express and Freight Traffic, begs to submit herewith, its report to the 1912 Convention.

In the preliminary work preparatory to making up this report, your Committee sent to various Member Companies, as is usual, Data Sheets requesting information upon certain subjects deemed vital by the members of the Committee and companies at whose suggestion certain questions were asked. The number of replies received, however, was so limited as to be of no value, in the opinion of the Committee, in making up its report and it was not deemed advisable to make comparisons using them as a basis. For this reason a detailed data sheet is omitted.

While the information gained in this way does not form a fair basis for analytical comparisons as to general conditions, it nevertheless does shed some interesting light upon certain features of this branch of electric railway transportation. The figures show a steady increase in investment and revenue, indicating a general expansion of the business and an apparent belief in its success as an additional source of income to operating companies. It is apparent that there is a general sifting down or concentration of opinion, as to where and under what conditions this service can be successfully introduced and operated. From the haze of theory and experiment, which must necessarily surround the development of a comparatively new idea, has come a solid ball of opinion based upon actual experience.

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From the replies received, which in this instance seem to be typical of the country at large, there is strong reason to doubt that the business can be carried on profitably by companies operating in cities only. The opinion of the majority is that it can be operated profitably in cities with a suburban service, and that, further, for its best development an interurban service, while perhaps in some cases not an absolute necessity, is a most important factor. Of the replies at hand but one states that "interurban service is not a requisite" and one expresses it "not necessarily." It is also very apparent from a study of the replies that this question, as well as virtually all those pertaining to operation, charges, equipment, etc., depend to a very great extent. if not entirely, upon the local conditions.

Aside from the matter of direct profit from the operation of the electric express and freight in itself, it is encouraging to read the expressions in the replies as to its effect upon the passenger earnings. Not one of the companies replying had experienced any bad effects. While a few had found that whatever effect there has been was not appreciable, the majority reported that the effect had been generally stimulating to the passenger traffic through the settling and building up of territory and the introduction of new industries that would naturally follow the extension and improvement of shipment facilities. This feature certainly deserves thoughtful consideration.

While replies were received giving express and freight and passenger receipts and expenses per car hour and per car mile, which at first glance would appear to give an excellent basis for a study of the comparative revenue of the two branches,—a more thorough analysis shows these figures to be of no general value, as the accounting and allotment of charges is so varied that no fair comparisons, based upon a similarity of conditions, can be made. In some cases, for instance, we find that the receipts from express and freight as compared with the expenses are proportionately very much greater than the passenger receipts, but the real value of this as a barometer is lost when it becomes known that in these instances, trackage, overhead and other charges are taken care of by the passenger service and not proportionately charged to express and freight, whereas in other cases this is done.

In the matter of receipts it is interesting to note that some of the seed sown by your Committee for 1911, fell upon fertile ground. This Committee went to some extent into the matter of the carrying of newspapers by the companies, expressing as its belief that this should be placed upon a strictly business basis and recommended that all companies make a charge for this service. This year's Data Sheets show that one company which at this time last year was carrying papers free, is now charging for this service and in eleven months reports an income therefrom of nearly $11,000, and this, it is understood, with the accompaniment of no rupture or friction in its relations with the newspapers of its territory. The recommendation mentioned above, your present Committee repeats.

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A careful study of the Data Sheets and a broad survey of the situation by the Committee, makes manifest two more or less related features to which it wishes to call special attention and upon which it proposes to base the substance of this report. One is the lack of attention which is being paid by the companies to the development of the less than car-load lot shipments, or package freight and express, and the other is the serious outlook which the entrance into the field of the auto-truck presents. Consideration of these two matters your Committee believes to be of the utmost importance at this time. They loom large in the future of the electric express and freight proposition.

Of the Companies replying to questions along this line, the rather surprising fact is shown that but three have a pick-up and delivery service, whether operated by themselves or others, while the companies reporting concerning the percentage of freight handled in car-load lots in some cases figure as high as 80 and 90 per cent of this character of business. Some of the reasons given for not operating this service are undoubtedly good, particularly in the case of those who say that in their territory the business is not sufficiently concentrated to justify it. As a general proposition, however, in the belief of the Committee it is a feature which a large number, if not a majority of the companies now operating an express and freight service, would do well to investigate thoroughly and put into effect at the earliest possible moment unless some specific local conditions exist that are antagonistic to it.

This is especially important in view of the early progress so plainly indicated in certain sections, of the serious menace of the rapid development of the auto-truck. While the auto-truck competition is now but a small cloud on the horizon and not at all visible in some parts of the country, there is every indication that unless prompt and effective measures are taken immediately, the near future will see it grow to such proportions, that to dissipate it will require all the energy and force the sun of the electric express will be able to produce.

For some years the street railways have shown the effect of the rapid development of the automobile, used simply as a private pleasure vehicle. More recently automobile lines have started up here and there, in direct competition with the trolleys and the competition thus developed has been distinctly noticeable. Now comes the advent of the motor-truck, which in almost a matter of months has been developed to an extent really astounding.

Investigation shows as yet little effect generally on the electric express and freight business, because of this competition. The companies who have felt it most seriously seem to be those operating in the more congested areas, where comparatively short hauls are the rule. This is true in Massachusetts, where records show about 3500 commercial vehicles licensed since Jan. 1, when the registration for each year begins. This number is being augmented with surprising

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speed, anywhere from 80 to 250 being added to the list each week. The same may also be said of the State of New York, where the Automobile Bureau of the Department of State reports 8278 registrations of commercial vehicles. Interurban lines with long hauls thus far have no competition of this sort; but as the truck is improved mechanically, are they not to be forced to meet its competition as well?

At the present time the laws provide no special obstructions to the auto service; there are no specially burdensome taxes or restrictions. Each individual auto is a power plant and full equipment in itself. It has no overhead charges and its roadbed is taken care of by a beneficent town, county or state. The great wave of good roads agitation sweeping the country, and the actual work following along behind, is constantly improving this roadbed and smoothing out the way of the truck. The tire bug-bear will undoubtedly be rendered less frightful in the course of time. Just now while there is a vigorous doubt as to the economy of the auto-truck in operation and the electric express has considerable advantage in this respect, the former is coming to the front with tremendous speed and unless the operators of the electric express move quickly, thousands of dollars will be invested in them and after the shippers have gone to this big outlay, it will be a long time before the general advantages of the electric express facilities will be powerful enough to induce their abandonment.

Bearing upon this subject, a recent article in the *World's Work* magazine, is of interest. It is entitled "Motor Trucks — The New Freighters. Quicker and More Reliable Service. Cleaner and Less Congested Cities. Concrete Examples of Saving." The article is by Rollin W. Hutchinson, Jr., who says:

"A horseless city and therefore a city of clean streets, a city in which the heavy traffic takes less space on the street and also moves more quickly that it does now, a city with a good delivery service to all the territory within twenty-five miles,— such are the conditions which the motor-truck builders believe in.

"The passenger automobile has been condemned as an incentive to luxury, praised as an influence for good roads and lauded for helping the farmer out of his isolation and for taking many city people to the country. But in the last few years the other kind of automobile — the motor truck — has become a large part of the industry. In 1910 the sales of pleasure cars (including many of course used for productive service of various kinds) amounted to $307,000,000. By the beginning of 1911, $60,000,000 worth of business vehicles had been sold since the inception of the industry. These 30,000 trucks mean usefulness and increased efficiency. This is not criticism of luxury against these cars, and they, as well as the pleasure cars, argue for good roads, and have made it easier for men and for businesses to move to the country."

Continuing he says: "A first-class, one-ton power truck is easily capable of travelling eighty miles a day. The three-ton truck can

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cover sixty miles and, if well built, is capable of repeating the performance six days a week without material yearly depreciation. A good five-ton truck will average fifty miles a day while a ten-ton truck can make thirty-eight miles."

The company operating an electric express and freight service in a large city with suburban territory must look for much business to the department stores. This investigator has the following to say on this subject:

"The experience of a large Brooklyn, N. Y., department store is of particular interest to the prospective as well as the actual user of power wagons delivering suburban merchandise, as it indicates just what may be expected under actual service in all kinds of weather, and it affords an excellent basis of comparison by which to check up expense accounts for transportation. Eleven trucks displaced thirty-three horses. The cost for six months was $8,709 for the horse delivery, and $7,349 for the electric trucks, a saving of $1,360 in favor of the machines; the cost of the trucks being divided as follows:

Mileage	84,022
Power Cost	$1,575
Maintenance Cost	3,392
Overhead Cost	5,125
Total	$10,092

The figures are for a six-months period from August, 1910, to February, 1911, the service being performed a year previous by horse-driven vehicles. In both cases, the salaries of drivers and helpers were the same, and, therefore, not a part of the comparison."

The writer further states:

"The motor truck is being used to-day in 125 separate and distinct lines of trade and industries, and newer fields of adaptability are constantly being found for it. Practically every business and industry in which transportation is a necessity — and there are few in which hauling materials or goods is not required — has been invaded by the horseless wagon.

"For express service the four leading American Companies have already invested $1,500,000 in motor trucks to facilitate the prompt and economical handling of packages. In this age of speed even the undertaker has motorized his funeral cars to hasten our transportation to final resting places."

This article is but one of many straws which show the tendency of the wind. As it says the motor-truck is invading every field. The danger to the electric express business, if not present in all sections of the country, is decidedly imminent. Is it not of sufficient moment to call for the most careful watching and energetic action? The Committee thoroughly believes that it is. The question is, what are we going to do about it? Companies replying to this question, presented

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in substance, say that the invaders whose outposts are already in sight can only be met and conquered by giving a better electric express and freight service or a cheaper, or both a better and a cheaper service. To this we would add the desirability of being in the field first, have your service in first-class operation, you men who are not already fighting this competition, have it firmly entrenched before the attack is made.

We also offer for your consideration, the recommendation that you look thoroughly into the package express pick-up and delivery service. Unless satisfied firmly by a study of your local conditions that it is not for you, put it into operation without delay.

A thorough development of the package pick-up and delivery service seems to be thoroughly essential, not only to combat this situation, but to the reaching of the highest point of development of the electric express and freight service, both financially and physically. In thoroughly developing this less than car-load business you will develop the car-load business at the same time without additional effort. If you can develop the less than car-load business to the extent that it hurts the old line expresses, they will fall into line and utilize your cars for the carrying of their express matter. We believe that you can only develop your less than car-load business, to the extent that it will hurt the express companies by an adequate pick-up and delivery service at your terminals and main stations and at the same time you can only compete with the automobile express service by a similar treatment, that is, by giving a first-class pick-up and delivery service.

In conclusion, therefore, your Committee urges you to take cognizance of what it believes to be a real menace, the introduction and development of the motor-truck, and to be forehanded in dealing with it, in the belief that the more firmly you are barricaded by the excellence of your established service, the less the danger will be, and to consider with the utmost care the advisability of the establishment of a pick-up and delivery in conjunction with your electric express and freight service. These two matters it believes to be the most vital in importance of any that are before us to-day in this branch of our business and we again say to you, with all possible emphasis, that if you do not operate the electric express and freight service now and intend to do so later, do not delay. Immediate action will save the climbing of a long, hard, expensive grade.

Also, we would say, if your local conditions warrant, or will shortly warrant the addition of the pick-up and delivery service, and you have none now, install it at once. It is far easier and safer to repel invaders from the inside of the battlements protected by the armament of a full equipment and established, satisfactory service than from the outside where it might develop into an open running fight with the only weapons of defense the mere promise of a better service.

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In submitting its report, the Committee wishes to express its sincere thanks for the co-operation of those member companies who by their answers to the questions sent out, have assisted in its investigation.

As an appendix to this report, we submit some views of typical express cars and illustrations of terminals, equipment, etc., used in connection with the freight and express business of some of the member companies.

Respectfully submitted,

H. E. REYNOLDS, *Chairman.*
A. R. PIPER,
J. C. CALISCH,
G. W. QUACKENBUSH,
F. W. COEN,
F. D. NORVIEL,

Committee on Express and Freight Traffic.

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APPENDIX A

ILLUSTRATIONS OF TYPICAL EXPRESS CARS, TERMINALS AND EQUIPMENTS.

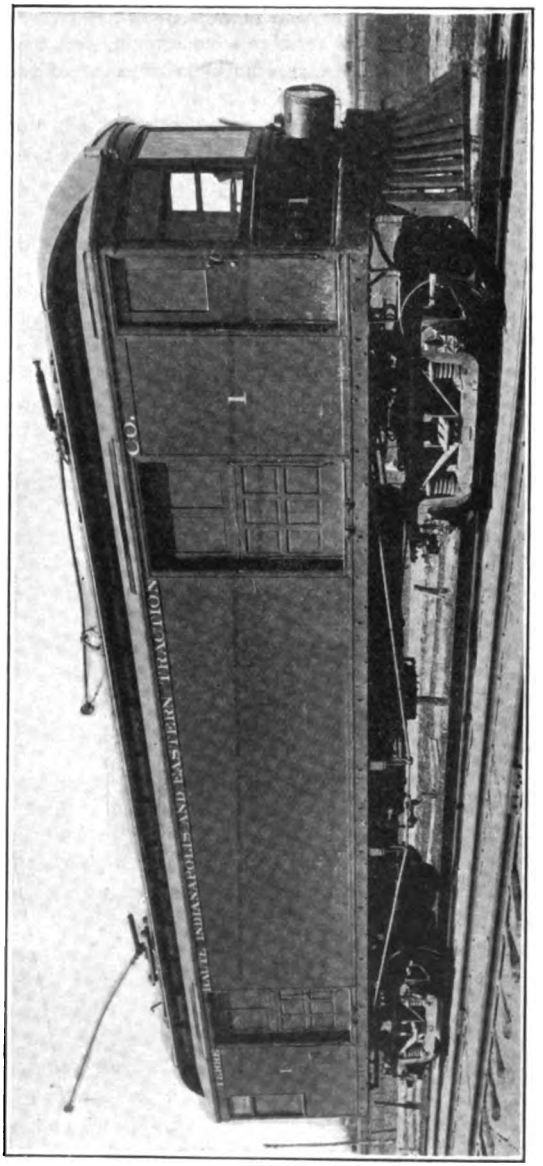

FIG. 1. SHOWING EXPRESS CAR OF TERRE HAUTE, INDIANAPOLIS AND EASTERN TRACTION CO.

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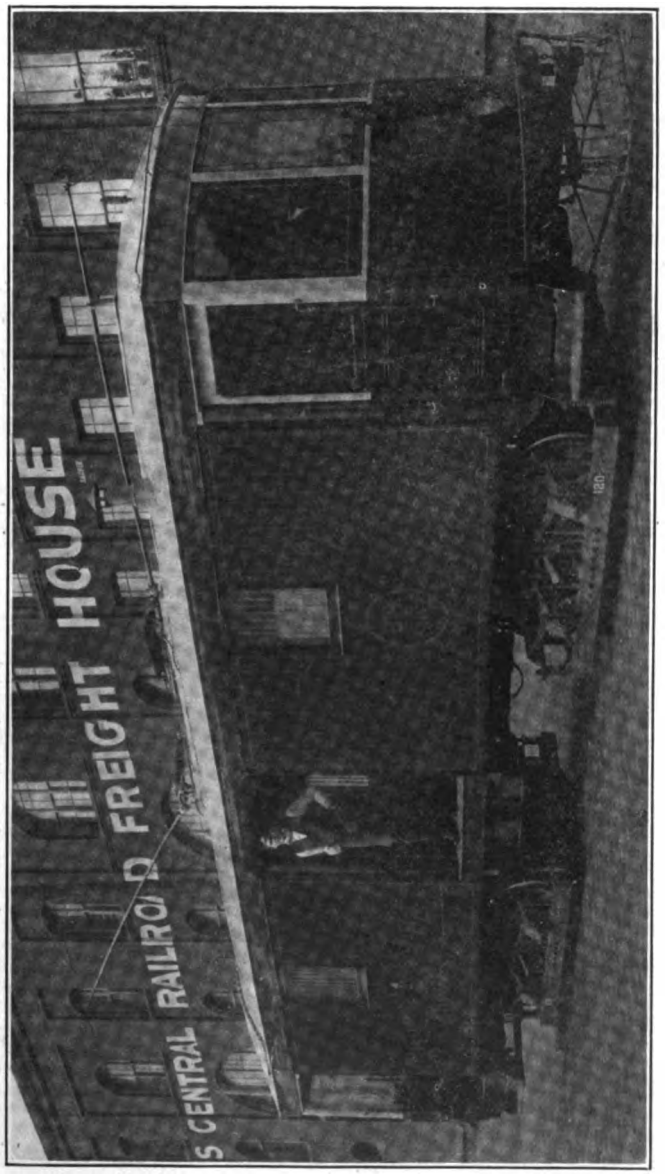

FIG. 2. SHOWING EXPRESS CAR OF SOUTHERN EXPRESS CO.

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FIG. 3. SHOWING BROCKTON WAREHOUSE OF BAY STATE STREET RAILWAY

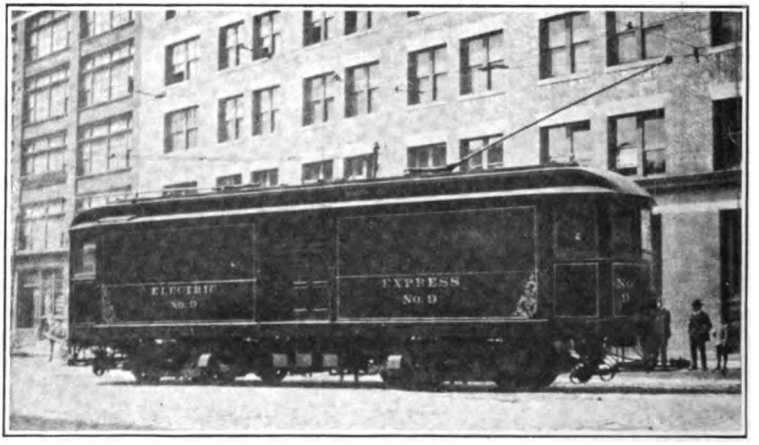

FIG. 4. SHOWING EXPRESS CAR OF BAY STATE STREET RAILWAY IN BOSTON AT TIME OF CHELSEA RELIEF.

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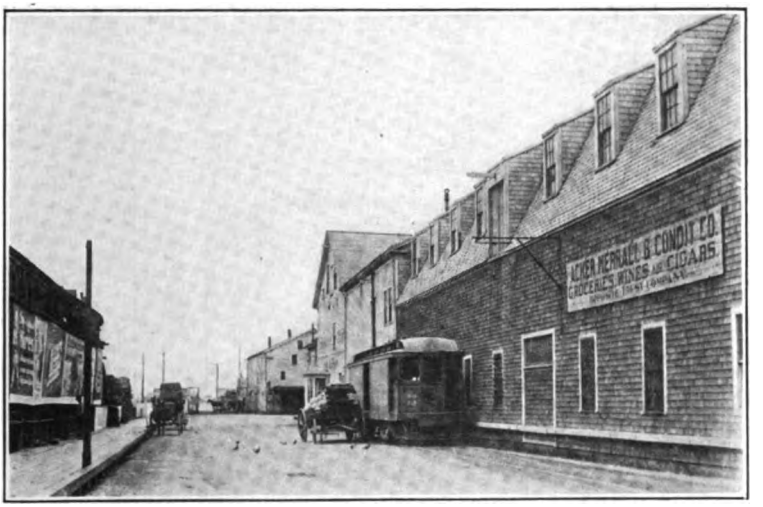

FIG. 5. SHOWING NEWPORT WAREHOUSE OF BAY STATE STREET RAILWAY.

FIG. 6. SHOWING NEW BEDFORD TERMINAL OF UNION STREET RAILWAY.

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FIG. 7. SHOWING INTERIOR OF NEW BEDFORD TERMINAL OF UNION STREET RAILWAY.

FIG. 8. SHOWING FALL RIVER TERMINAL OF UNION STREET RAILWAY.

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FIG. 9. SHOWING INTERIOR OF FALL RIVER TERMINAL OF UNION STREET RAILWAY.

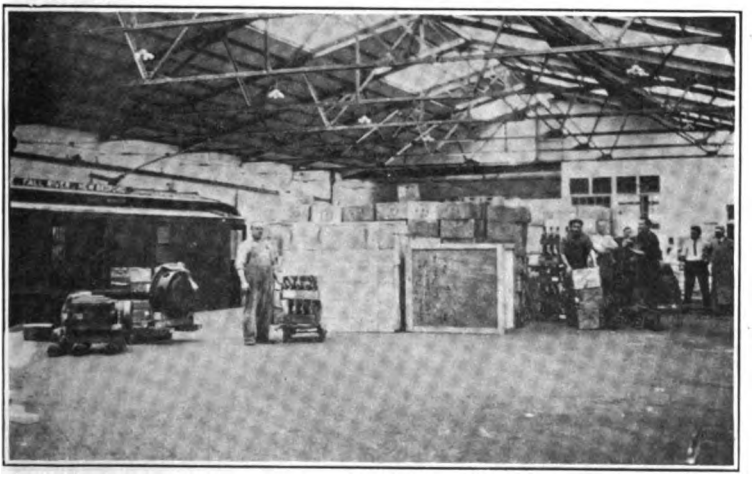

FIG. 10. SHOWING INTERIOR OF FALL RIVER TERMINAL OF UNION STREET RAILWAY.

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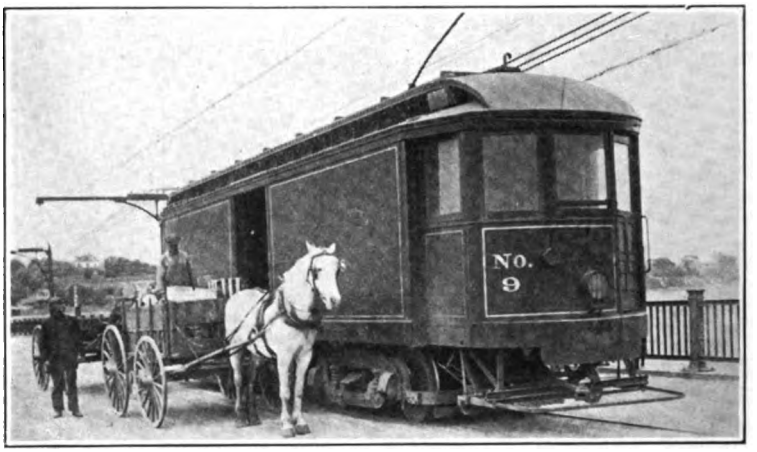

FIG. 11. TRANSFERING LOAD ON BAY STATE STREET RAILWAY.

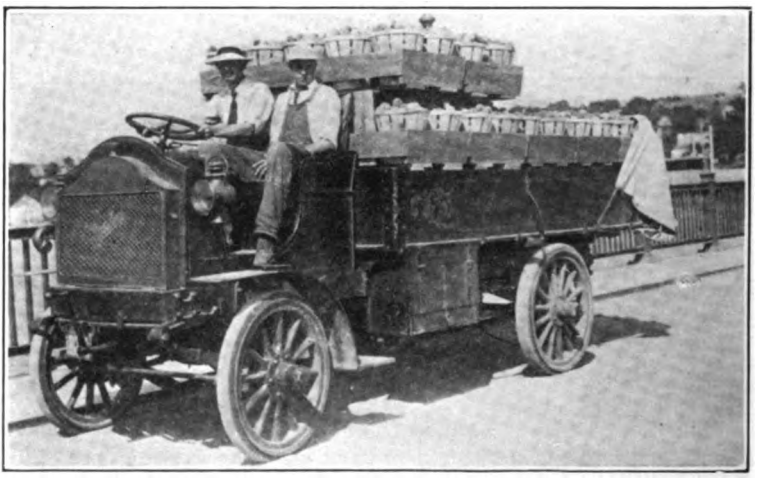

FIG. 12. SHOWING TRUCK LOAD OF PEACHES TO BE LOADED ON EXPRESS CAR OF BAY STATE STREET RAILWAY.

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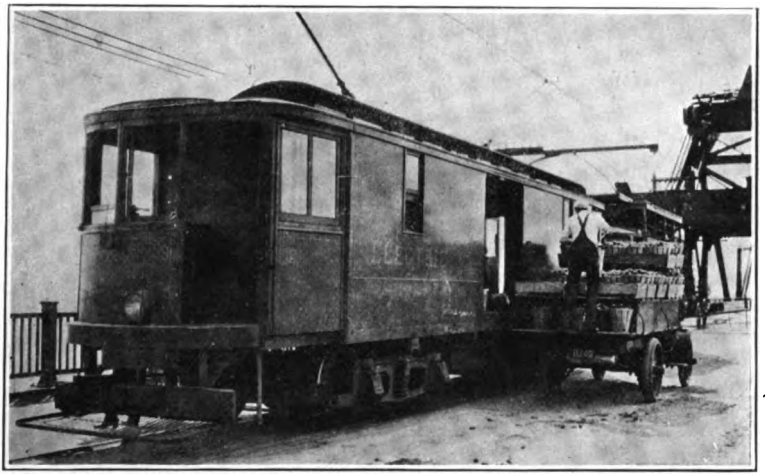

FIG. 13. LOADING PEACHES ON EXPRESS CAR BY BAY STATE STREET RAILWAY.

FIG. 14. SHOWING STANDARD BOX OR GRAIN CAR OF ILLINOIS TRACTION SYSTEM.

FIG. 15. SHOWING STANDARD COAL CAR OF ILLINOIS TRACTION SYSTEM.

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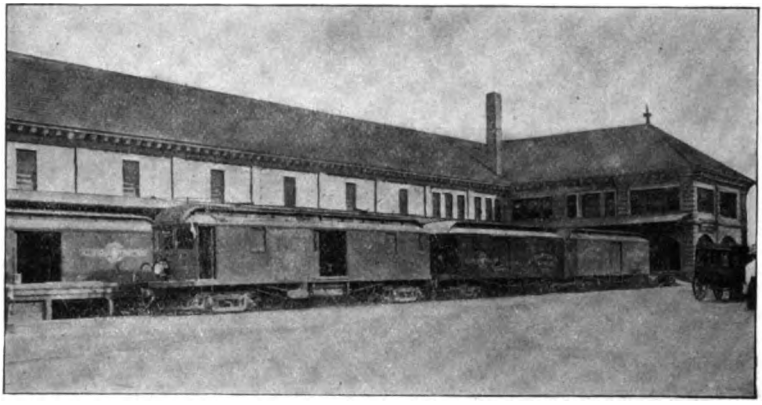

FIG. 16. SHOWING FREIGHT TERMINAL AT ST. LOUIS OF ILLINOIS TRACTION SYSTEM.

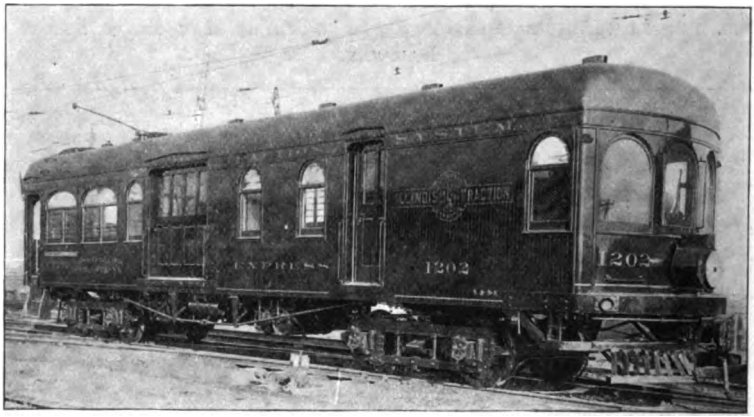

FIG. 17. SHOWING COMBINATION EXPRESS AND PASSENGER CAR OF ILLINOIS TRACTION SYSTEM.

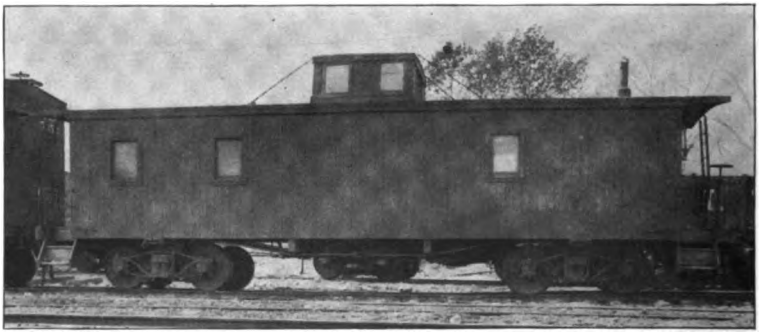

FIG. 18. SHOWING STANDARD CABOOSE OF ILLINOIS TRACTION SYSTEM.

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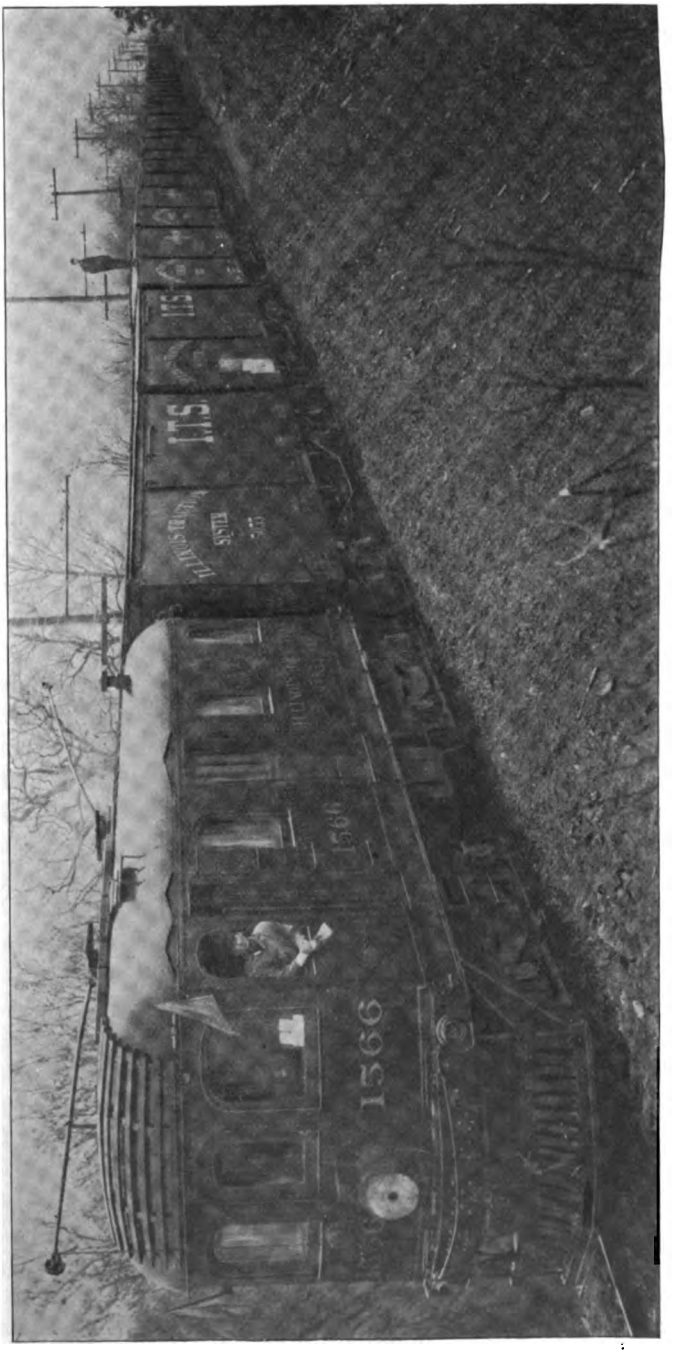

FIG. 19. SHOWING ELECTRIC LOCOMOTIVE HAULING STRING OF STANDARD BOX CARS ON ILLINOIS TRACTION SYSTEM.

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Discussion of the Report of the Committee on Express and Freight Traffic

MR. NORVIEL:—The securing and compiling of the data necessary for the report on Express and Freight Traffic, read before this Convention, is one requiring a vast amount of labor, and should receive the fullest consideration, as it is only from these researches and the experiences of many rolled into a concrete form, that we are able to arrive at the happy medium which will do the most good for the most lines.

It is a fact well known that more good can be accomplished with a united front than otherwise. This is true of all questions.

It is fair to assume that the Committee on Express and Freight Traffic, was appointed for the express purpose of pointing out the way wherein the electric railroads could secure all of an equitable revenue for services rendered.

In the report of this Committee for 1911, certain recommendations were made; but the data secured for 1912 would indicate that but few lines had profited therefrom.

The matter of some lines not charging for the handling of newspapers was pointed out as a loss of legitimate revenue.

The data for 1912 has also developed some new features, one being a new rival for handling merchandise; the auto-truck. Let us not make light of this new invention, as our steam line friends did of the electric railways when they first entered this same field. The auto-truck is a real menace, but like may other troubles looms up most ominously in the distance. We can readily see where, in some localities, its presence might be serious, if proper means were not adopted to counteract its influence. This might be especially true in congested business centers of the East, where hauls would be comparatively short. This same competition is not unknown even in the Middle West, where they have taken from the electric railways some suburban business. With perfect roads, without toll, or any expense for up-keep of roadway, and for moderately short distances, where the auto-truck can back up to the wholesaler, load and deliver direct to the consumer; why should they not get this business? We must expect it; however, with down-town freight houses, plenty of team-

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track room, ample facilities for taking care of "in and outbound freight," without unnecessarily delaying drays and trucks and with proper railroad service, equitable rates, no traction line of reasonable length, of itself or by connections, reaching into country districts need fear but that their freight and express business will keep pace with their facilities for handling same.

By "equitable" we do not mean that it will ever be necessary to name a non-revenue securing rate, as such a procedure is not now in fashion; we have all learned that it is much harder to advance even a ruinous rate than to originate it. The answer is "get together," find out the proper basis for making rates, the basis on which rates can be made by *electric railways* and produce a reasonable profit after all expenses are paid. This should include not only the actual operation of the cars but its proportion of all over-head expense. How can this be accomplished? By getting at the unit of expense per ton-mile and the revenue for same; in this we must enlist the co-operation of another part of the railroad company's machinery and that is the auditing department. It is not all in just keeping the accounts straight, but to show by proper debits and credits which portion of our business pays, how much, and if there is any part of it not paying then apply the remedy. If the handling expense cannot be reduced there is only one solution; increase the carrying revenue.

That fifty per cent. of the electric railways in the United States are now committed to the handling of freight and express in some form, seems to the writer as good reason for suggesting certain lines to which coming work can be properly applied.

Rates, class and commodity — local and interline.
Interchange of equipment.
Inspection of equipment at Junctions.
Freight claims, rules governing the interchange of freight.
Weights and inspection.
Exceptions — local and joint.
Territorial, constructive and franchise restrictions.
Routings and per cents.

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Classification — this latter being probably the most important of any single tariff, certainly requiring the greatest amount of care and labor in its construction.

There are sections of the country today served by thousands of miles of interurban lines, being governed by through interline tariffs and divisions, and giving this service with a dispatch which is impossible for our competitors to equal with their present cumbersome mode of handling freight, and this is only a beginning.

It strikes me that there are two distinct avenues open to the Traction lines; "common freight," by which we mean, freight moving on ordinary freight trains, in bulk, either car load or L. C. L., single motor, or in trains, making trips over a line once or twice a day handling rought freight of all kinds, at rates on par with steam roads; the other, a higher class "package freight" (express, if you will) handled in the baggage vestibule of passenger cars. This should be at a higher rate, approximating one and one-half times the first class freight rate, or about half way between ordinary freight rates and old line express companys' rates. Neither of the above described service would contemplate a pick-up and delivery; if this class of service is desired I believe without exception, it would be better to contract with one of the old line express companies, which should not conflict with either of the above described services. For a pick-up and delivery, more net revenue can be secured from an old line express company than we can possibly hope to get from any independent service.

The main point however, is *co-operation* along the lines set out herein. There is no section of the country where conditions are so dissimilar but that the same rules can by slight modification be made to apply.

MR. COEN:—There is one portion of this report that I would like to call attention to — that regarding the auto-truck service. Some time last summer or fall the Retail Merchants' Board of the Cleveland Chamber of Commerce met with the representatives of the Interurban roads a number of times and requested us to make each Wednesday an Excursion or Suburban Day in Cleveland, and on that day reduce our rates

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to approximately one fare rate for the round trip. In return the merchants were to advertise the plan but proposed to keep their rates stationary. It was the consensus of opinion on the part of the Interurban people, however, that they could not do anything of this sort, and possibly some things which they have done this year may have grown out of this refusal. It is in this connection that I want to give you a little information. These merchants now run what they call an auto-truck service, extending East and West of Cleveland, a maximum distance of about 35 miles East and approximately 27 or 27½ miles West. A considerable number of the merchants participate in this, among them some of the very best, though others of the prominent merchants have refused to join in the movement. They sent out a little circular concerning the movement and it seems that a membership fee of $2 is required. Just what that is for I don't know, unless it is to keep their organization in line in some way or other. This circular, a copy of which I have, states that on Mondays, Wednesdays and Fridays, packages will be delivered in Bratenahl, Nottingham, Collinwood, Euclid, Wickliffe-on-the-Lake, Willoughby, Fairport, Painesville, Mentor, Wickliffe and intervening points. On Tuesdays, Thursdays and Saturdays, packages will be delivered in Dover Center, Dover, Ridgeville, Elyria, Lorain, West Dover Station, Beach Park and intervening points. In other words it seems that they use but one truck, which, I take it, is about a ton truck in capacity. In order to add the data to this report, on September 27th and 28th we counted the packages carried and found that on the eastward trip on Friday, September 27th, there were forty-five packages, and on Saturday, September 28th, fifty packages. Packages are limited to 25 lbs. and the charge, paid by the merchant, varies from eight to fifteen cents per package, depending upon the distance. Two men look after the truck, one operates the machine, I presume, and the other takes care of deliveries. It would seem from this that the expense of this service certainly was far in excess of the amount that the merchants are paying on the package rate. Another thing, the packages must all be delivered by the merchants to a central point or to the auto delivery warehouse

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in the central portion of the city. That shows about the extent of this service after it had been in operation, I should say ninety days. Their service eastward is, I think, very largely on good roads. A portion of their service west from Cleveland is on very bad roads, a little later in the season. Another thing, from what information I have been able to gather and from what I have personally observed, it seems that the service is very largely through the country which is adjacent to the city, but to people who are not served by any railroad service of any kind. I am inclined to think that when the bad weather comes on the service will be discontinued.

MR. NORVIEL:— I would like to ask Mr. Coen whether there is any feeling of retaliation from the competitive lines, or rather from the cities themselves that are adjacent to Cleveland.

MR. COEN:— No, I think not. That was one of the questions which came up when the matter of this reduced rate proposition was proposed to us, and they put it up pretty hard — just about as hard as they dared.

We considered the matter very seriously. I think a few of the companies received some pretty strong communications from the merchants in the smaller places. They felt as though the reduced rates from the smaller places to the larger city would take the trade away from them.

MR. HAMMOND:— I might say for the information of the members that on an interurban road of thirty-six miles we started an express service on the first of April. We received in April about $1.40 a day, and in September about $14 a day. The only expense that we have is $60 per month for a man who looks up the business and takes care of it. Total amount paid for loss and damage, $2. The business is handled on regular cars. The principal traffic is from merchants to customers along the lines and it is growing. We paid about $60 for the express tags, which will last about a year. The shipper receives no receipt. There is a conductor's coupon on each tag on which is indicated point where delivery was made, also date and hour. This coupon is turned in by conductor each trip.

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There is no collection and delivery service; everything being brought to the station or waiting room by the shipper. The rates are based upon weight and are somewhat lower than standard express rates. I don't know what the percentage is but where the express rate is 25 cents, our rate would be approximately 15 cents.

Where the minimum rate is ten cents for 50 lb., for 100 lb., it would be 20 cents. Where the rate for 50 lb. is 20 cents the rate for 100 lb. is 30 cents.

MR. COEN:— There is one other question that seems to me enters into this quite materially, or will in the near future, January 1st, and that is the Parcels Post. I suppose there are a great many packages that we handle that come within their weights, 11 lb., and this is a collection and delivery service too, a great deal more extensive than any of us have. It will reach every part of the country. This will catch us quicker and harder than the automobile will.

MR. FRANKLIN:— In Portland, Oregon, we have an express service on our interurban road, and we have for quite a few years operated a delivery service in connection therewith. We would call at certain places in the business section where they had a sign out and pick up freight the same as the express companies do several times a day. We would also deliver packages within a certain radius. Our rates were practically express rates, slightly lower. We found that the delivery part of the business by the auto-trucks was quite an expense, and we resolved to discontinue it, which we did. It brought forth quite a good deal of dissatisfaction on the part of the merchants, and some of our largest shippers, among which were some of the department stores, undertook to make their own deliveries in the suburbs. However, this did not last long, and they finally came back to us and now deliver their packages to our freight depot and call for them. We found that we lost a little business for a short period of time but it all came back, and is far in excess of what it was.

PRESIDENT SHANNAHAN:— Referring to the question of the Parcels Post, there was a very excellent article by Senator Bourne, who, as you all know, drew the bill, in a recent issue of the *Saturday Evening Post*.

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MR. SMITH :— I might state in connection with the package freight situation that has been discussed here this morning that we experienced exactly the same proposition and I am glad to say that we have overcome the difficulties that we were experiencing by its use.

The system is what is known by us as the " Parcels Freight Stamp system." This system is gotten up in freight stamp books of different sizes and sold in book lots at different prices according to the number, weight, etc., which the stamps cover.

The rules and regulations governing the weights, distances, limits, etc., are outlined on the face of the stamp.

The rates these movements are based on are about midway between the express rate and the regular freight rate.

The bulk of these goods are moved in the baggage compartments of our regular passenger cars as we generally have small packages which are more advantageously handled by us on our passenger cars than on our freight cars at the same time deriving a better revenue and giving the people better service.

To those using these stamps we assume no responsibility for any loss that might be brought about in these movements nor do we take or give any receipt for same. The stamp books are sold to our patrons and the stamps are placed on the packages, which are loaded on the various cars at any stop in the city. On arrival at destination they are turned over to the agent and delivered by him without any receipt whatever being taken for same.

We have indeed found these services to work out very satisfactorily, the only one objection that we find is that it has to be watched very closely in order that our patrons do not take advantage of it.

I also take advantage at this time to place before your honorable body our general freight situation. I might state that our line connects with the Western Maryland at Thurmont and that we handle with them a full interline freight business governed by all I. C. C. rules and regulations as well as a regular interchange of cars.

We are at this time operating our freight business with both electric and steam locomotives, our scarcity of power not

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enabling us to handle all of our heavy freight traffic by electricity.

Our freight business is handled on uniform bills of lading and our rates to all foreign points are competitive with roads leaving or entering this city.

The B. & O. and Pennsylvania are our competitors and I am glad to state that we are able to compete with them in every respect to any point that we are able to cover through our connections.

You will find recorded on the tariff files of several of the railroads in Chicago our line, quoting you from there to Frederick rates that are competitive with both the B. & O. and Northern Central lines.

MR. HAMMOND:— There is another little matter we started on September 1st, namely, a five-cent check room tag which we sell to merchants. The merchant puts this tag on a package and sends it to the station. The customer comes for the package when he is ready to go home. If it is a large package, the customer sometimes sends it by express and we get a revenue from that. If not, he takes the package with him. During the month of September we received about $2.50 a week revenue from this.

PRESIDENT SHANNAHAN:— Is there any further discussion on the report? Hearing none, we will pass to the next order of business, the Joint Session with the Accountants' Association.

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WEDNESDAY MORNING SESSION

OCTOBER 9, 1912 (*Continued*)

JOINT MEETING TRANSPORTATION AND TRAFFIC AND ACCOUNTANTS' ASSOCIATIONS, BLUE ROOM, SADDLE AND SIRLOIN CLUB

President Shannahan, of the Transportation and Traffic Association, called the meeting to order and asked President Young of the Accountants' Association to preside.

(President Young in the chair.)

PRESIDENT YOUNG:— Gentlemen, before we come to the proceedings of the Joint Session, I wish to state for the information of the members of the Transportation and Traffic Association that the Executive Committee of the Accountants' Association have invited Mr. William M. Steuart, Chief Statistician, Department of Manufactures, Bureau of Census, to address us on the subject of the compilation of statistics for the next census. Mr. Steuart must leave town today, and with your permission I will introduce him to you and request him to make the address to the Associations. I am sure it will be interesting to each one here, even though he may not be familiar with the subject.

MR. STEUART:— Mr. President, and gentlemen: My business is primarily with the Accountants' Association, but the Federal census includes statistics of equipment and traffic as well as the finances of each company. In collecting statistics we are frequently met with the assertion that the Governments are overdoing this class of work; that the railways and other industries are approached by the Federal Government and by the States' Governments, and in many instances by the County and Municipal Governments, all seeking information somewhat of the same character; and while there may be no objection to furnishing this information, nevertheless it does take time to prepare the data, and it causes the companies considerable inconvenience. Therefore they do wish that the Governments would get together and agree upon a schedule that would cover all of the information required for their various lines of inquiry. I am in sympathy with this sug-

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gestion, and wish myself that it were possible to have such an understanding, but this is a young country and your industry is young, and it is impossible now to formulate such an ideal arrangement. So far as the Federal Government is concerned, there are, I believe, only three officers that touch the railroad interests, the Interstate Commerce Commission, the Corporation Tax Division of the Internal Revenue, and the Bureau of Census. The first two are with you now almost constantly, at least both of them touch those roads that do interstate business. The latter is the one that I am interested in and have been connected with for many years. It collects statistics only once every five years, and to be certain that I do not occupy too much of your time, I have made a memorandum of the objects of the census which I will read you.

PLANS FOR THE 1912 CENSUS OF ELECTRIC RAILWAYS

By WILLIAM M. STEUART, *Chief Statistician for Manufacturers*
Bureau of the Census, Washington, D. C.

There are numerous State, City, and Federal offices that collect statistics and information in regard to electric railways and other public utility enterprises. The Federal Census Bureau, however, is the only one that gathers data to show the magnitude of the industry in the entire United States. The province of all the other offices is primarily to compile data showing the conditions under which certain roads or groups of roads are operated; the character and cost of the various services rendered; the sufficiency of the equipment and other matters that are largely of local concern.

The census shows the importance of the industry as compared with the other industrial developments of the country. It is not the province of the Bureau to promulgate certain forms of accounting or to insist upon detail statistics if the collection of such detail will retard the preparation of general totals for the United States.

The census is taken every fifth year, and it has been my pleasant duty to appear before you at the past two censuses and solicit your co-operation in making the work a success. There are many railroads included in the census of the United States, and unless the Bureau has the sympathy and assistance of the persons from whom the statistics are collected, it is impossible to cover the entire country, tabulate and publish the results in time to make them of current interest and value.

The first census with which the American Electric Railway Account-

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ants' Association was identified covered the year 1902. When the office commenced work on that census we were not aware of the existence of the Association. The fact that you were an important factor in all matters affecting the railways of the country was brought home to us by a committee headed by Mr. Duffy. This committee came to Washington and carried matters in very much the way they wanted them to go. Following the recommendation of this committee the Bureau adopted your form of accounting. This resulted in a wide distribution of the form and was of material assistance in having it adopted more generally by railways throughout the entire country. It was the first census that had been taken of the industry since electricity had become an important factor in the operation of roads. Great difficulty was experienced in applying your form of accounting to many of the companies, and I feel that the Census Bureau is entitled to considerable credit for the systematic promulgation of the system. The work led to the general adoption of your forms much more rapidly than would have been possible by any other method. At the same time the office took a more satisfactory census of the industry than had ever been taken before.

The next census covered 1907, and the same form of schedule was used. The form having been established, you did not think it necessary to appoint a committee to look after the details of co-operating with the Bureau, but in response to my plea the members of the Association did assist the office in securing the reports, and the totals for that census are generally accepted as a correct presentation for the United States.

These two census reports are now established books of reference for information concerning electric railways in the United States, and their value is due largely to the work of your Association in devising the system of accounts and in assisting the office representatives in the preparation of the reports for the different companies. The co-operative arrangement has been creditable to both parties, and I now hope that similar arrangements can be made for the census of 1912.

Since 1907 the Interstate Commerce Commission has entered actively upon the collection of statistics of electric railways, and has agreed with your Association upon a system of accounts. During the past two or three years the Commission has received reports from a large number of companies engaged in interstate business. At present there are about 270 companies reporting. The state railroad officials are calling on the Federal office to furnish them with copies of the blanks so the same form may be used in collecting the data required by local governments, and the Commission now sends these forms to 21 states, a total of 1,661 blanks, with proper instructions, having been distributed in this manner during the present year. This shows that the form of ac-

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counting is being generally accepted, but it is not used in some states and the Bureau of the Census has found considerable difficulty in applying it to the smaller companies. It calls for more detail than is necessary to comply with the law providing for the census, and it may be that a simpler form can be devised for the coming census, or some modification can be made of the form to be used by different classes of companies. At any rate we desire to adopt a form of schedule that will be consistent with modern methods of collecting statistics concerning railways that will enable the office to compile statistics for the principal facts that will be comparable with those for the same facts given in the reports of prior censuses, and the preparation of which will cause the companies the least degree of inconvenience.

At the censuses of 1902 and 1907 agents of the office visited every company in the entire country. This required a great deal of time and seriously delayed the publication of the results. The work could be done much more quickly, and I am certain more satisfactorily to all parties interested if the companies would send in their reports by mail. At the coming census they will all be given an opportunity to do this. Most companies have now established the practice of making government reports of some character, and I believe that the majority of them would prefer to prepare the census report without any interference on the part of an agent.

The Census Bureau has under consideration also the possibility of using for census purposes the reports made to the Interstate Commerce Commission and thus avoiding the preparation of two reports to the Federal Government from the same company. The census, however, covers a calendar year, while many of the other government reports relate to a fiscal year, and we desire your advice in regard to changing the census practice.

The financial data heretofore furnished the census has been treated as confidential, and no person other than the sworn employees of the office have been permitted to examine them. It is now the common practice for the separate reports of all companies to be given the public, and possibly there would be no objection to the census publishing the details for some companies as representing certain conditions.

The office desires to confer with you in regard to these and other matters affecting your industry. I therefore suggest that if compatible with your regulations, a committee be appointed to cooperate with the office in the formation of the schedule and in the settlement of other matters that are necessary in the taking of the census and to confer with the office during the progress of the work. A similar committee has been appointed by the National Electric Light Association. The two industries are closely allied and it will be of advantage to apply similar methods to both in taking the census.

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Mr. President, I believe that is all I have to say. I do hope, however, that the Association will act on the suggestion and co-operate with the office to the extent of appointing a committee with which we can negotiate.

MR. FORSE:— I move that the thanks of the Association be extended to Mr. Steuart for his interesting address, and I further move that the chair be authorized to appoint a committee to co-operate with the Census Bureau in the manner outlined by the speaker.

(Motion seconded.)

SECRETARY DONECKER:— Might I ask Mr. Forse whether he intends that committee to represent the Accountants' Association only, or both the Accountants' and the Transportation and Traffic Associations?

MR. FORSE:— I understand from Mr. Steuart's address it is primarily addressed to the Accountants', however, I believe that should be left to Mr. Steuart. If it is his idea that representatives from both Associations should be on this Committee, let such action be taken.

PRESIDENT YOUNG:— It seems to me that the thanks certainly of both Associations should go to Mr. Steuart, and the Chair will take it upon itself to appoint a committee for the Accountants' Association if the motion is carried.

(Motion carried.)

PRESIDENT YOUNG:— The Chair will announce the appointment tomorrow. The next order of business is the report of the Joint Committee of Express and Freight Accounting, Mr. J. C. Collins, Co-chairman.

REPORT OF THE JOINT COMMITTEE ON EXPRESS AND FREIGHT ACCOUNTING

To the American Electric Railway Transportation and Traffic and the American Electric Railway Accountants' Associations:

GENTLEMEN:— The general purpose of the appointment of the Joint Committee on Express and Freight Accounting was the development of a method that could be applied by electric railways transacting freight or express business for division of their operating expenses between passenger on the one hand and freight or express on the other. In order to meet this desire of the Associations the Joint Committee prepared for its report in 1911 a plan which it was believed could be

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used in the approximate segregation of the expenses between the two classes of traffic. During the last year the work of the Committee has been confined to the further consideration of the details of the method outlined in the report of 1911 and to the discussion of the practicability of the general adoption of such a method of division of operating expenses. After consideration, the Committee has not thought best to make any change in the plan of segregation described in the report last year. It finds that a slight change has been adopted by one company that applied the recommended division and reference is made to this fact in order to show that experiments have been made with the plan. According to the 1911 report the charge for power should be prorated on the basis of the total passenger and total freight car mileage. The company mentioned has charged its freight service with an arbitrary cost for power per freight car mile instead of prorating this expense on the basis of car mileage run by freight cars. Another company continues to use the car mile basis of division, and experiments with its charges indicated that the results shown did not differ materially from those given by the application of the 1911 Committee report.

During the discussion of the entire subject by the Committee the practicability of the division of operating expenses between the two classes of service has been considered with care. The question of a fair, complete division of expenses is one that is extremely complicated. If such a segregation is made at all it is based necessarily on the assumption that for this purpose the passenger and freight services of an electric railway are of the same proportionate value to the company as the relative gross earnings or relative car mileage taken as the basis of division. This, of course, is an assumption with which many will disagree and on which the Committee itself is not a unit.

The relative expense pertaining to the different sources of income of an average electric railway which operates a freight or express business in connection with passenger traffic is difficult to determine. We may take as an example some of the larger and better known interurban systems of the Central West which develop, although for shorter average hauls, the same classes of traffic carried ordinarily by steam railways. These companies differentiate between their express and freight business. That is to say, they handle freight in their cars or in cars received in interchange from other roads and carry express only as this business is conducted directly by one of the old line express companies. Some of the central western interurban systems go even further in their search for business and carry what is known as dispatch freight. This is hauled in passenger cars under a separate classification and is treated like express business, except that it is carried simply from railway station to railway station without wagon pickup and delivery service. Any attempt to prorate expenses is complicated by such a condition as this.

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The Committee recognizes fully, that for the convenience of the general and operating officials of the company, it is desirable that the costs of rendering different classes of service be determined as nearly as possible but it wishes to impress upon the Association all the obstacles that exist in the way of perfect segregation. If the expenses pertaining to freight department were of such a nature that they could be segregated completely from all other expenses the determination of the cost of rendering freight service would be simple. Since that is not possible, however, the Committee reiterates its belief that such a system as it recommended last year is the most practical method that has been made available, so far, for an estimate of results. It believes that all charges which can be made directly as, for instance, for freight house terminal expenses should be applied in that way and that the number of charges which have to be prorated should be reduced to as few as possible.

It is apparent that a system of segregation of expenses involves somewhat the same principles that are found in any attempt to dissect the operations of a part from the operations of a whole. The electric railway company operating in a large city has, as a matter of fact, little more of a guide to the success of its operations than the balance remaining after provision for operating expenses, taxes, fixed charges, etc. If it takes merely the gross operating revenues, operating expenses and net operating revenues, it can determine what amount is available for interest and returns on the stock investment. It can show what the gross earnings are, either in total amount or per car mile, for any given line or lines and can apportion the operating expenses on the same basis. It cannot surely separate one line or division from the other lines in the system, because all are inter-dependent and the results combined determine whether the system is a success or a failure. In the same way the city railway system cannot easily apportion its power costs as between different lines or between different hours of the day. It may make an arbitrary division but the result is not more than approximation. The Joint Committee on Express and Freight Accounting is renewing its recommendation of a system that in its opinion is the best that has been developed up to this time, continues to confine its recommendation to a division of the expenditures that are classified as operating expenses. It makes no recommendation for a division of taxes, fixed charges or dividends, which are elements in the cost of service just as much as are the operating expenses. These are questions which each company that believes that a division is practicable can work out for itself. The investigations of the Committee have shown that in some cases the inclusion of a proportionate charge for interest, taxes, etc., in the accounts would make the freight business show a deficit. At the same time the freight service provides a greater use for part of the exisiting facilities of the railway and from that standpoint it affords an opportunity of which the company should take advantage if it is con-

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vinced that reasonable business conditions justify the development of such traffic. It is not reasonable to say, that as a railway has a fixed investment in plant, equipment and rolling stock it can afford to operate the freight business if that yields anything over the operating expenses of the cars. If that argument is followed to its last analysis and applied similarly to the passenger business too, the company would be in sorry straits.

The Committee believes that development of the freight business of electric railways, with adequate rates, is in the interest of the companies. The consistent increase in this class of traffic reported by those companies that have really made a business of seeking to build it up shows that the prospects merit the careful attention of general and operating officials. For that reason the Committee believes that further research will be profitable for the companies and that the Joint Committee representing the Accountants' and the Traffic and Transportation Associations should be continued. In the initial years of operation of interurban roads the freight revenue was a very small proportion of the total revenue. It has become a much more important source of revenue now and demands closer attention of experienced officials in order that its possibilities may be developed fully. In many cities on many systems the erection of proper terminal facilities for freight service is already an important and serious problem. Some lines are handicapped seriously in the proper development of freight service by their lack of adequate stations. This is due in part perhaps to the reluctance of financial supporters of the companies to risk much capital in any department but the passenger service when the road was started. It was believed generally then that the passenger department would furnish nearly all of the gross revenue of the companies. The lack of adequate facilities is due in some places to the use of tracks of city companies instead of private right of way, together with other restrictive legislation which tends to discourage further development. With all of these matters the Committee on Express and Freight Accounting has not dealt, except so far as they impressed upon it the importance of detailed study of operations.

The Committee recommends that the Joint Committee of the coming year take up the question of accounting for freight and express revenues in addition to the continuation of the study of accounting for freight and express expenses.

J. C. COLLINS, *Co-Chairman.*
J. K. CHOATE, *Co-Chairman.*
E. L. KASEMEIER.
WALTER SHROYER.
G. H. HARRIS.
E. C. SPRING.

Joint Committee on Express and Freight Accounting.

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PRESIDENT YOUNG:— This report is now before the meeting for discussion.

Discussion of the Report of the Committee on Express and Freight Accounting

MR. CHOATE:— Mr. Chairman, I doubt very much if I can add much to this report. I am perhaps the unit referred to in the report that was not entirely in accord. I am strictly an operating man and, probably the poorest man on accounts that you could discover. Just exactly why I was put on the Committee I can't imagine, except that last year I offered to throw a stone or two. The company I represent, however, does a very large proportion of its business in freight service. It might be interesting possibly to give a little outline of what our service is. The Otsego & Herkimer is a cross country line operating 90 per cent. of its entire distance on private right of way. It connects physically with three of the large Trunk Line Railroads and does an exchange business handling steam railroad equipment. In addition to doing a general freight business, the express business of the line is carried on by one of the old line express companies (the United States Express Company), under contract. Our company also conducts, between its largest cities, a package freight similar to the express service on many city and country lines. The road in itself is equipped with stations at all important points with agents, and operates on steam railroad principles. We have made it a rule to charge everything we possibly could against the freight service. Many of the things shown in the report of last year are easily charged, like station service, and many other similar charges, that are found in regular steam railroad practice, but our great difficulty comes in making a comparison with the other lines in that we operate our passenger service and express service on the unit system, charging mileage for each individual unit whereas in handling our freight service we use the train mile unit. In other words, the only mileage that appears in our accounts, whether it be on empty cars or full car-loads, is the mileage of the motor. Our trains vary from a single trailer to twenty, and naturally the earning capacity of trains varies with each individual train, a long train of loaded cars, of course, showing very large earnings, whereas

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a train of empty cars shows no earnings. It has therefore been very difficult to adopt any system of accounts that would give a record by which we might compare our results with others. Some of our accounts show abnormally high, particularly in the cost per car mile. We offset this, of course, by abnormally high earnings. We have always tried to encourage our accounting department to find some way by which we ourselves could better understand our own operations. We charge everything we possibly can to our freight business and our results have been most satisfactory. We are a freight road largely, 33 per cent. of our earnings being from freight traffic.

MR. HYMAN:— It seems to me that on any line whether handling freight, express or package freight, it is not only very important but almost an absolute necessity that the cost of operation should be known. About six or seven years ago I visited most of the large cities in the Middle West, with letters from prominent traction men that opened the accounting departments to me. I found in almost every case that not more than thirty per cent. of the proper charges were being shown against the earnings of the freight or express service. In some cases the gross earnings were figured as the net earnings, no expense of agents, stationery, or the time of the accounting being charged against gross earnings derived from express or freight. It seems to me that it would be possible that these expenses, irrespective of the cost of operation of freight cars, could be aggregated, and could be charged against the gross earnings, and the balance left would be the net earnings to the company except the operating expense at so much per car mile. By this system a road could tell how many miles the freight cars had to travel and by the deduction of expenses of agents, etc., added to the cost per car mile companies would know whether they were actually earning one cent per mile or losing two cents per mile. The Electric Package Agency assumes every cent of expense, not one cent of expense being charged to the railways. Every item of expense is paid by the Electric Package Agency, which is the freight department of the City and Suburban Lines running out of Cleveland. We even pay a portion of the expenses of the railway men in sub-stations.

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It is figured out as to how much time these men spend on our business and how much on the railway company's business. We even pay rent to the railroad companies. If one of the railway employes gets injured in the handling of freight, we have to pay the claim, and it seems to me that no matter how large the road is that some scheme or some method should be devised so that every expense which is incurred is charged against the gross earnings, and then they will know just what they actually earn.

MR. CHOATE:— I would like to ask the gentlemen if the method of accounting submitted by the Committee does not exactly cover the situation?

MR. HYMAN:— Yes, I think it does. Only my experience has been that there are very few roads that are carrying it out.

MR. J. C. COLLINS:— Mr. President, I might add that that is just the difficulty. The Committee last year suggested a system of accounts which it thought was practicable for the roads conducting an express business, but very few of them want to adopt the method. I find even in the Committee itself that there is a division of sentiment. Some thought the proposed method of making up a statement of expenses rather than keeping the accounts as suggested on their books, was better, because it would require expense of operation and detail of looking after it, and thought that if the management wanted a statement of the expenses, then it could be prepared. In my judgment that is extra labor. What you are doing daily you can very readily sum up at the end of the month. I think the difficulty is that the roads themselves will not really adopt the system as submitted.

PRESIDENT YOUNG:— I find that possibly a paragraph from last year's report might help in this discussion. I will read it:

"Your Committee took up separately each of the 88 accounts prescribed by the Interstate Commerce Commission in its classification of operating expenses of electric railways and a plan for the division of each account as between the two branches of traffic was considered, and the recommendations made are in accordance with the opinions of the majority of the Committee. It is the unanimous opinion of the members of the Committee that all items of expense that can be charged directly should be so charged.

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"Careful consideration has been given the matter of the adoption of the 'car-mile' against the 'ton-mile' unit, and it was decided that the 'car-mile' should be the unit basis adopted in view of the fact that interurban railways, with very few exceptions, are handling freight in a comparatively small way and the freight car mileage is only a small percentage of the total car mileage. It would, therefore, seem advisable to continue the car mileage unit until such time at least as the earnings of freight traffic reach proportions that will justify the additional expense necessary to maintain the records which would be required by the use of the 'ton-mile' unit."

Then in the report are shown the 88 accounts with the title and the basis of division. For instance, Maintenance Accounts 1–28. The division is pro rata upon the basis of the total passenger and total freight car mileage. That division is used to quite a considerable extent but I think it would take too long to itemize and read over again the report. It is all there if any one should wish to refer to it.

MR. SMITH:— In connection with the discussion that has been opened this morning relative to the trouble encountered in finding the exact cost of freight business: I would state that while it is difficult to get this expense exactly, with a little approximation it can be very closely arrived at. Of course, in finding the cost of movements of freight a basis must be agreed upon, which in my opinion is but one; and that is the cost to move one ton of freight one mile or in other words the "ton mile" basis. From this basis you can figure any expenses that might have to be paid in connection with the freight business.

As a matter of information, we kept account of the movements of pounds of empty cars separate from full cars, also the count of each mile that the car makes, but I do not think that this is absolutely necessary to get a good idea of how profitable freight business is.

Of course, you would have to approximate the cost of your agent at this work and you will have to know the cost of the current, and use meters to determine the amount of same used. With these matters carefully worked out I believe that we would be able to very closely determine what freight business is worth.

In my opinion, freight business has great possibilities among

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electric railroads and that more time should be spent in the working and developing of same.

Our freight revenue for the past year is between sixty and seventy thousand dollars and whilst we are not in position to quote you exactly what percentage we are making on freight business, we are in position to state that freight business is more profitable to us than the passenger business.

MR. SHROYER:— I would like to ask if any of the member companies have applied the report as outlined last year and if the results have been found satisfactory.

MR. CHOATE:— Mr. Chairman, we practically applied it. The only place where we have any great difficulty is in the clause just read with regard to the matter of keeping the record of the mileage. It is impossible to figure on the freight car mileage and get satisfactory results. We keep a mileage account of every car that moves over our line, but how to differentiate between a loaded car and an empty car and the character of its load and to get results that will show whether it is profitable or not, is a most difficult matter. We have covered it by taking and making a general estimate of what the mileage is, and of what would be required of station service, electrical service, etc., checking this every four months and, arriving at arbitrary percentages which we make on the high side and charge directly to this account. The plan has proved fairly satisfactory, and we believe shows a result that is absolutely reliable. It is leaning backwards rather than forwards, and if anything is unfair it is to the freight rather than to the passenger side of the operation.

MR. HIXSON:—The first step is to get the proper unit. There are certain types of station expense, stationery, etc., which might be apportioned on some other basis, but I don't think you can do anything until you get a decision on the unit.

MR. CRAFTS:— My company has used this system of accounting recommended by the Committee in more or less modified form for several years. In fact, I was one of the guilty parties who assisted in getting up this classification.

Two years ago we entered into the steam railway freight business, handling freight by steam, and, of course, it increases our accounting slightly to carry it on the car mile unit rather than the ton mile, or train mile, but we find in connection with

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the operation of the electric passenger and package express business, the car mile unit is of considerable value.

It occurs to me that possibly some of the interurban companies whose freight traffic produces the larger proportion of the total revenue might well adopt or gradually work into steam railway units which, I believe, are prescribed by the Interstate Commerce Commission. I think that every company handling freight in any manner at all should ascertain by this classification whether or not the handling of freight, packages, or anything but passengers is a profitable business. If we are deceiving ourselves, or if we are trying to deceive ourselves by not keeping some proper system of freight accounts, it is high time that we should find out where we stand. I believe, from the work on the Committee in the two previous years, with members who were connected with large properties, that this classification will assist all freight carrying interurbans.

PRESIDENT YOUNG:—Has any one any objection to the system?

MR. NORVIEL:—A review of the report of your Committee on Express and Freight Accounting, reveals a fact which seems to the writer as of much moment. Quoting from their report, "After consideration, the Committee has not thought best to make any change in the plans of segregation described in the report of last year."

Quoting still another section of this same report: "the Committee believes that development of the freight business of Electric railways, with adequate rates is in the interests of the companies."

These two sections of your Committees' report seems to me as being the meat of the nut, as the first quotation would indicate that your Committee believes that the plan as outlined in its report of 1911, is as good a one as is possible. This being the case, how many roads, members of this Association, have acted on the suggestion, and separated the overhead expense, so that the freight business has been charged its right proportion of this item? If this has been done have you gone still further and learned the unit cost per ton mile for handling freight? For, without this information it is impossible to know what would be an adequate rate basis for handling freight and express.

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Traffic officials on the electric railways, have been greatly handicapped by not being able to secure a correct figure as to the actual cost per ton mile for freight handling. Neither have they been able to secure an accurate figure as to the earnings per ton per mile haul. During the past season some progress has been made along this line by some of the larger roads and it is to be hoped that another twelve months will give us some reliable authority on this subject to work upon. It has been the practice in the past for the traction lines to quote the steam railroad classification rate between the same points where they come in competition. It can be readily seen that as regards the equity of these rates compared to the expense it is all largely guess work and to arrive at an intelligent basis for the naming of freight rates, it is absolutely necessary for reliable figures covering the points named above.

This necessity for revenue information is recognized by your Committee in the last paragraph of their report.

That no absolutely correct division of expenses can be arrived at, it would appear better to reach as nearly an accurate figure as is possible, even though certain items may necessarily have to stand an arbitrary division.

Even express matter — merchant's despatch freight — carried on passenger trains without additional expense for cars, crews, station or station expenses, should stand its proportion of all direct and general expense, which would from its character require many arbitrary decisions as to its proper proportion; still, it should be done, as it would then lessen the expense of passenger cars chargeable against the passengers carried, thus reducing the cost of "the passenger per mile hauled."

While it is true all other departments should receive the information necessary to form a careful estimate of the future up-keep of their particular department, it seems that the revenue and, which is the life-blood of the railroad company has not received the attention it deserves and which I believe will be given it in the future.

Co-operation between the Traffic department, the Accountant's department and the Transportation, are essential to the economical operation and revenue production of their trains.

MR. CHOATE:— May I ask the gentleman one question? What is a "ton-mile" unit?

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MR. NORVIEL:— In the matter of expense, it is the cost per ton, per mile of freight hauled. The revenue would be figured in just the same way.

MR. CHOATE:— The Committee recommends that exactly. Now, I contend that there is not such a thing as a "ton-mile" unit, nor is it possible to have such a thing as a ton-mile unit. The number of tons transported a certain number of miles is shown in every report at the end of the year. Now, that comes from an accounting system, and taking into account everything that can be charged to it, and the strength of the Committee's report which I am now inclined to bow to more than I did a year ago, is that everything that can be directly charged to that account should be, and that will take in under this system of accounting in these 88 counts suggested, more than 90 per cent. of all the costs that go with the charge of handling your freight. Now, the arbitrary part comes in your mileage and takes up this other 10 per cent. which can be arrived at very closely, but there is no such thing as a ton-mile unit.

MR. NORVIEL:— Mr. Chairman, I beg to differ with the gentleman. There is a wide difference between a car-mile basis and a ton-mile basis; for instance, a car may run over a road seventy miles, and it may handle twenty-five tons, but may handle that only ten miles, and the balance of the trip would be made without any tonnage, and the costs of the operation of that car would not differ any at all. That is the difference between the ton-mile and the car-mile basis.

PRESIDENT YOUNG:— That is what we are here for, to bring out these fine points.

Is there any further discussion on this report? The report contains a recommendation that the Joint Committees of the coming year take up the question of accounts for freight and express revenues, in addition to studying accounting for freight and express expenses. The Chair will entertain a motion in line with the recommendation.

MR. CHOATE:— I move the approval of the report and that it be accepted.

(Motion duly seconded and carried.)

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PRESIDENT YOUNG:—We now come to the report of the Committee on Fare and Transfers. The report will be presented by Mr. T. C. Cherry, Chairman.

MR. CHERRY:—With the permission of the President, I will simply read the recommendations of the Committee and call upon those prepared to discuss the recommendations.

REPORT OF THE COMMITTEE ON FARES AND TRANSFERS AND PREPAYMENT CAR OPERATION

To the American Electric Railway Transportation and Traffic and the American Electric Railway Accountants' Associations:

GENTLEMEN.— Your Committee on Fares and Transfers begs to report that during the present year it has endeavored to justify the confidence of the Executive Committee as expressed in its instructions to this Committee and which left to your Committee on Fares and Transfers the development of the line of work to be conducted, simply expressing the thought that in its view the methods of collection and accounting of fares has been the phase of electric railway work which has shown the least development despite the fact that it is the one of paramount importance to the operating companies.

Your Committee desires to concur in these sentiments of the Executive Committee, and though it has been impossible for the Committee during the present year to develop recommendations which would tend to any advanced and improved departure from present methods, it is, nevertheless, able to present some matters which appear to be worthy of the consideration of the members.

Furthermore, it might be stated that your Committee has co-operated with a committee appointed by the Accountants' Association to consider, especially, matters in connection with the collection and accounting for fares on prepayment cars, and this report, therefore, is in the nature of a joint effort.

Several meetings have been held during the year and the general outline of the work has been as follows:

1. A study of fare collection and allied subjects in connection with interurban operation.

2. A study of the effect of the transfer system upon the gross earnings of operating companies.

3. The collection and registration of fares in connection with prepayment car operation.

Taking up these matters in the order named, the Committee has developed the following:

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COLLECTION AND ACCOUNTING OF FARES IN INTERURBAN OPERATION

A data sheet which forms Appendix A of this report was sent to selected interurban companies, in order that the committee in its developments might have the benefit of the experience of some of the leading officials engaged in interurban electric railway transportation. A study of the replies received, which did not in all cases coincide with the final recommendations of the Committee as set forth herein, has in considerable measure been a guide to your Committee in arriving at conclusions, which in the judgment of the Committee make for good practice. In view of the wide divergence of views on many or all of them, however, the Committee feels that the recommendations should not be adopted by this Association without full and free discussion. The Committee believes that all of the points under discussion are important and while some of them, upon casual inspection, may appear to be of only slight value, discussion will develop a diversity of views which will testify to their importance. In other words, matters which on offhand consideration may seem of only casual interest will, upon closer attention, prove to be essential features of our operation and this is more true of the various matters which relate to the collection and registration of fares than to any other branch of the electric railway business.

The Committee, therefore, desires to recommend, with regard to interurban operation, the following:

(a) That through collections of fares be made instead of collections by zones.

The Committee feels that the recommended method is superior to the collection by zones plan for several reasons, perhaps the most important of which is the fact that it is more convenient to your passengers and so will have a tendency to promote popular good will because of freedom from the annoyance of frequent requests for payment of fares during a given trip. A strong advantage lies in the fact that the work of your conductor is decreased, leaving him free to care for the other duties which devolve upon him and thus permits him to give greater attention to the comfort and safety of his passengers than would otherwise be possible. It also offers less liability for errors in the collection and accounting of fares and should have a tendency to reduce the number of missed fares.

Another point of much importance lies in the fact that it would perhaps be physically impossible for many conductors to properly collect all fares under the zone collection plan where the zones are short in length and the speed of the trains great.

On crowded cars, also, much inconvenience is caused by frequent trips of the conductor in the collection of fares. While it is true that under the zone system where registers are used, the opportunity is given for checking the passengers in each zone as traveled, it is not

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felt that this is of sufficient importance to over-balance the good points heretofore mentioned in favor of through collections. Again, in the method of through collection recommended may be found the opportunity to develop statistics for the use of your traffic department which may not, without considerable trouble, be available under the zone collection plan.

(b) Recommended that, where interurban roads enter a city over a foreign company's tracks and are required to report the number of city passengers carried, interurban tickets should have a city coupon which will be collected within the city limits as a second collection, in the same manner as city fares are collected.

Your Committee believes that the recommendation above provides the simplest method of segregating interurban and city fares, and one that calls for the least expenditure of time in the accounting of such fares. It does not believe that the fact that through passengers are asked to retain a coupon places any particular additional burden upon such through passengers and it is therefore not likely to lead to complaints from them, inasmuch as they are not called upon to pay fare a second time but simply to retain the city coupon which is collected as the car passes into city limits. Furthermore, if records of city fares are to be made and shown upon a register, it would mean, if the plan adopted above was not effective, that the conductor would either have to collect the city fares as the car enters the city and ring up as collected, or he would collect them at the same time he collected the through interurban fares and would register the city fares all together as the car entered upon the city tracks. This would mean that the city fares of all interurban passengers would be rung up by the conductor at one time, or "in bunches," to use the vernacular, and this ringing up of a number of fares at one time is rightly considered bad practice. The collection and registration of a city coupon in the same manner as local fares are collected and registered would also provide an absolute check on all city passengers.

The recommendation is also based upon the belief that the majority of interurban companies which operate over city tracks are required to keep a distinct record of passengers carried upon their cars while operated over city tracks.

(c) Recommended: Where a class register is used, that a hat check showing destination and amount of fare paid be issued to passengers paying cash fare;

Where a register is not used, that a cash fare receipt showing destination and amount of fare paid be issued to passengers paying cash fare;

Where a class register is used, that tickets be registered at the full one-way cash value and passenger be given a hat check indicating destination and that fare has been paid by ticket;

Where a register is not used, that passengers tendering tickets

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receive a hat check indicating destination and the fact that fare has been paid by ticket;

That both cash fare receipts and hat checks be collected by conductor before passengers leave train.

In explanation of the above recommendation, the Committee wishes to first of all express the opinion that good public policy is best served by safeguarding the interests of the passengers and that the issuance of some token that will indicate the fare paid and thus obviate possible subsequent argument with the conductor and the development of antagonism upon the part of the passenger because of such trouble.

The recommendation proposes that the cash fare receipt or the hat check serve in the same manner as a guide to the conductor as to the destination of the passenger and also precludes the necessity of the issuance of both a cash fare receipt and a hat check to one passenger.

The recommended registration of a ticket by an indication of the full one-way cash fare makes it possible to intelligently register all tickets regardless of the rates at which they were sold, and does not in any way increase the work of the auditing department in developing a record of train earnings. In fact, this work is simplified by a subsequesnt recommendation which insures the segregation of all classes of tickets by trips.

The recommendation that cash fare receipts and hat checks be collected by the conductor before the passenger leaves the car would be an insurance against the reissuance or use of such tickets or checks, particularly if the subsequent recommendation that they be turned in by half trips is followed. The Committee believes that the recommendation is essential to safeguard the interests of the operating companies as it makes it impossible to use these receipts or tickets except upon the trip which they were originally intended to cover. It further believes, in answer to the argument that this receipt belongs to the passenger, that further retention of the receipt by the passenger is not justified inasmuch as the service which such receipt is intended to cover has been performed when the passenger reaches his destination, and it is therefore of no further value to the passenger but is of value to the company for the purpose of checking receipts.

(d) The Committee recommends that conductors be required to turn in tickets, cash fare receipts and hat checks at the end of each trip, cash to be turned in at the end of run.

It is believed that this practice will aid substantially in the proper carrying out of recommendation (c) and will assist in the prevention of the improper use or manipulation of the vouchers required to be so turned in. It has the added advantage of permitting the management to keep in more immediate touch with receipts and also provides proper and necessary segregation for subsequent checking by the auditing department.

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(e) In order that more detailed information regarding traffic may be secured, the Committee is of the opinion that it is good practice to require conductors to furnish a separate trip sheet for each half trip.

In the opinion of the Committee the separate half trip record recommended above would give very useful information to the traffic department and aid substantially in the development of proper schedules. It would provide information as to the number on the cars in the different sections of the line at different periods of the day, thus indicating to your transportation department the points where business is in most need of development. While it may be possible to develop the same information by a trip sheet which includes a complete run, it cannot be worked out without considerable trouble and a trip sheet including the whole period of work is at best a very cumbersome record to handle.

(f) The Committee believes that it is not good practice to permit conductors to sell any tickets on cars, particularly those which are sold at a rate lower than the cash fare rate and therefore recommends that, wherever possible, the sale of tickets be confined to officers, agents or other authorized persons other than conductors.

In the opinion of the members of the Committee recommendation (f) has many advantages, as for instance, that it decreases the work of the conductor and allows him time to devote to other duties as described under recommendation (a). By confining the sale of tickets to duly authorized agents greater care and supervision can be maintained by the officials of the companies and the accounting methods can be much simplified. In addition, it obviates any complexity in the transactions between conductors and passengers, and beyond question the more simple such transactions can be made the more advantageous to both passenger, conductor and company. Another advantage lies in the fact that a safeguard against the manipulation of tickets is provided.

(g) The Committee recommends that the conductor, in collecting fares, should do so beginning at the front of the train and working to the rear.

The Committee believes that this recommendation will provide good results in that it reduces the length of time required to collect heavy loads. The conductor, being in front of and approaching passengers, tends to induce the passenger to have the fare ready and thus enables the conductor to more quickly reach his regular station on the car.

The Committee would be glad to have a general discussion on this point, as there seems to be a well divided opinion concerning it, many companies claiming that where zones are short and time fast, collections should be made from the rear to the front of the train in order that short riders may not be enabled to reach destination and leave cars without payment of fares.

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(h) The Committee recommends that conductors be required to cancel tickets in the presence of passengers immediately after collecting same.

The advantages of this recommendation are obvious and it is thought that the practice is quite generally specified. However, in the opinion of the Committee, the rule is not rigidly enforced and the Committee has therefore recommended it, in order to bring the importance of the matter to the attention of the member companies, with a view to having them prescribe a more rigid enforcement of the regulation.

(b) THE EFFECT OF THE TRANSFER UPON THE GROSS EARNINGS OF ELECTRIC RAILWAY COMPANIES

The Committee through a subcommittee consisting of Messrs. Wood and Dempsey has collected information from various representative companies, covering a period of years, concerning the issuance of transfers. A data sheet was prepared and sent to a selected list of companies, and as a matter of interest to the members a reprint of the inquiry form is shown in this report as Appendix B.

The subcommittee, from the information thus received and from other data in hand, offers in Appendix C a development which the Committee believe will prove of value to every one of our members who utilize the transfer upon their systems.

(c) PREPAYMENT CAR OPERATION

As Appendix D, there is submitted a study of the matter of the collection and accounting of fares in connection with prepayment car operation. This has been prepared after discussion between this Committee and the Committee representing the Accountants' Association and has been developed under the personal direction of Mr. M. R. Boylan, Chairman of the last named Committee. The increasing use of prepayment cars makes this portion of the report one of much importance to the members, and a thorough and complete inspection of the matter contained therein is requested by the members of the Committee.

Respectfully submitted,

T. C. CHERRY, *Chairman.*
F. T. WOOD,
J. V. SULLIVAN,
J. J. DEMPSEY,
J. J. JOHNSON,
E. C. DEAL,
Committee on Fares and Transfers.

M. R. BOYLAN, *Chairman.*
H. J. DAVIES,
C. N. HUGGINS,
Special Committee of Accountants' Association on Prepayment Car Operation.

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APPENDIX A.

AMERICAN ELECTRIC RAILWAY TRANSPORTATION AND TRAFFFIC ASSOCIATION.

COMMITTEE ON FARES AND TRANSFERS.

1. Do you consider it good practice to register cash fares inside city zone, and to give cash fare receipts in interurban zone? Please give reasons for your answer. . . . . .
2. Do you consider it good practice to register cash and tickets in interurban zone? Please give reasons for your answer. . . . . .
3. Do you consider it the best practice to have a city coupon on all interurban tickets where the originating point or the destination is a city where a separate count of city passengers is required? Please give reasons for your answer. . . . . .
4. Do you consider it the best practice to collect through including city fare, or make a separate interurban and separate city collection? Please give reasons for your answer. . . . . .
5. Do you recommend the use of hat checks? Should the conductor lift them before passenger leaves train? . . . . . .
6. If cash fare receipts are given should conductor lift them before passenger leaves train? . . . . . .
7. When should conductor turn in tickets collected? . . . . . .
8. If interurban tickets are to be registered, is it the best practice to register coupons at their cash value? . . . . . .
9. Is it bad practice to sell round trip tickets on trains? Why? . . . . . .
10. Should the conductor work his train from the front to the rear, or vice versa? Why? . . . . . .
11. If cash fare receipt for interurban ride is given, should conductor also register fare? . . . . . .
12. Is it a good rule to insist upon the immediate cancellation of tickets upon collection? . . . . . .

Name of Road. . . . . .
Name of Officer. . . . . .
Title . . . . . .
Date . . . . . .

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APPENDIX B

AMERICAN ELECTRIC RAILWAY TRANSPORTATION AND TRAFFIC ASSOCIATION

COMMITTEE ON FARES AND TRANSFERS

How the Transfer Affects Revenue

YEAR*	Total passenger receipts	Number 5-cent passengers	Number other revenue passengers	Number free transfer passengers	Number free passengers
1900					
1901					
1902					
1903					
1904					
1905					
1906					
1907					
1908					
1909					
1910					
1911					
1912					

* The following information by years from 1900 to 1912 inclusive, fiscal year ended June 30th understood unless otherwise specified.

YEAR	Number other free passengers	Total number passengers	Total passenger car mileage*	Total revenue passengers per car mile
1900				
1901				
1902				
1903				
1904				
1905				
1906				
1907				
1908				
1909				
1910				
1911				
1912				

* Exclusive of freight and express car miles but including run-off or dead car or disabled car milage.

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APPENDIX B — (Continued)

YEAR	Total free passengers per car mile	Total passengers per car mile	Total receipts per car mile	Average fare per passenger
1900				
1901				
1902				
1903				
1904				
1905				
1906				
1907				
1908				
1909				
1910				
1911				
1912				

Please state regarding transfer privilege, whether universal without limitation, whether limited as to direction, whether limited as to number of times person may transfer.

State whether the figures above given include physical transfer of passengers where no tickets are collected.

NOTE.— In general, the above data is desired on the basis of reports made to the State authorities.

Signed: Company

Date Official

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APPENDIX C

REPORT OF THE SUB-COMMITTEE ON THE GROWTH OF TRANSFER TRAFFIC

REPORT OF THE SUB-COMMITTEE ON THE GROWTH OF TRANSFER TRAFFIC

Through the courtesy of the Secretary of the Association, data sheets were sent out to street railway lines in a number of the larger cities in the country, requesting information for the fiscal years 1900 to 1912 inclusive. The information sought involved considerable work on the part of those companies who kindly responded to the appeal and forwarded the desired data. Replies were received from eleven cities, but in one instance the records prior to 1906 were apparently not available and consequently the data in this particular case were not used in the comparison referred to below. As the figures for 1912 were not reported in every case, the year 1911 has been selected for purposes of comparison with 1902, which was the earliest year regarding which adequate information was obtained.

The figures under the heading Transfer Passengers do not include the passengers who were transferred from car to car without the use of tickets. A number of the companies do not keep any record of the passengers riding on complimentary passes, of employees who ride on displaying their badges, or of other free passengers (other than transfer passengers), consequently in the figures given below all passengers of this character have been eliminated.

The companies were requested to give the total passenger car mileage figures including run off or dead car and disabled car mileage; freight and express car mileage was to be excluded.

The following is a recapitulation of the data received, in most cases based on the fiscal year ended June 30th although in some cases the year ended December 31st.

	Fiscal year 1902	Fiscal year 1911	Increase	Per cent increase
Passenger receipts	$54,945,494.39	$82,176,065.58	$27,230,571.19	49.56
Number of revenue passengers	1,112,062,821	1,670,275,201	558,212,380	50.20
Number of transfer passengers	399,137,058	725,548,622	326,411,564	81.78
Total revenue and transfer passengers	1,511,199,879	2,395,823,823	884,623,944	58.54
Total passenger-car mileage	217,018,454	281,164,797	64,146,343	29.56
Revenue passengers per car-mile operated	5.12	5.94	.82	16.02
Transfer passengers per car-mile operated	1.84	2.58	.74	40.22
Total revenue and transfer passengers per car-mile operated	6.96	8.52	1.56	22.41
Total receipts per car-mile (cents)	25.32	29.23	3.91	15.44
Average fare per passenger (cents)	3.64	3.43	*.21	*5.77

* Decrease.

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It will be noted that while the total receipts in round figures increased 50 per cent. the transfer passengers increased 82 per cent. and the total passenger business increased approximately 59 per cent. with an increase of about 30 per cent. in the car mileage operated, giving a ratio of 8.52 passengers per car mile in 1911 as against 6.96 passengers per car mile in 1902; it will also be noted that the receipts per car mile were 15 per cent. higher in 1911 than they were in 1902 while the average rate of fare per passenger was 6 per cent. lower in 1911 than it was in 1902.

In considering these figures it is well to bear in mind that with the expansion of electric car operation throughout the country there has probably been a very material increase since 1902 in the size of the companies whose figures form the basis of this report. Not only has mechanical traction superseded animal traction but new lines and extensions of old lines have undoubtedly been constructed with the growth of the cities involved. This has all meant an enormous outlay of capital for track construction, car houses, power houses and car equipment.

It is probable that the average length of ride of passengers has increased as compared with the conditions in 1902. While the number of passengers per car mile in 1902 was less than the number of passengers carried per car mile operated in 1911, this does not by any means warrant the conclusion that the congestion in 1911 was greater or that the service afforded was inferior. Since 1902 great improvement has been made in the type of car equipment; the small single truck cars have been giving way to large double truck cars and to the prepayment cars of the various types, so that with the larger car in service, the number of people carried per car mile could well be materially increased without resulting in as much congestion per unit as existed in 1902 with the type of car then operated.

Taking into consideration the increased cost of material and supplies, the increase in wages paid and the improved character of the equipment in service with the vast amount of additional capital involved upon which the railways are entitled to earn a fair return, it is significant that the average fare per passenger carried is less now than in 1902. Of all delinquencies which rightfully or wrongfully have been charged against the street railway companies we have never heard it hinted that they have contributed to the increased cost of living and in view of the above figures it is scarcely conceivable that they are likely to be so accused.

Your Committee is fully aware that it has not made any great discovery in compiling and comparing these figures. How much further this process of increasing investment, advancing wages and rise in price

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of material and supplies can continue before the whole financial structure is undermined and wrecked by the reduction in the rate of fare due to transfer extension, imposition and abuse, is one of the most important if not the vital question which confronts the street railway companies of this country today.

Respectfully submitted,

J. J. DEMPSEY,
F. T. WOOD,
Sub-Committee.

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APPENDIX D

PREPAYMENT OPERATION FARES ACCOUNTING

For two years, members of the Accountants' Association have had before them for consideration the subject of Prepayment Fare Accounting. It is an important subject and one on which much remains to be said. Involving, as it does, the study of methods for guaranteeing, so far as possible, the collection of every fare from passengers on cars and governing the transmission of the money to the company's treasury, it can be readily appreciated that time and thought spent in developing a reasonably perfect adequate and economical system of collecting and auditing such receipts is bound to be a paying investment.

The first paper, submitted before the Convention of 1910, was devoted to a presentation of the locked box and separate compartment method of collecting fares on prepayment cars. It treated specifically of the four-compartment type of receptacles and told in detail of the methods pursued in the handling and counting of the cash, the forms of reports to be made by conductors and receivers and the system of checking the returns. A copy of this paper, including samples of forms used, was embodied in the record of the proceedings of the Accountants' Association for 1910.

Experiments and experience demonstrated to the satisfaction of certain companies that had been using a four-compartment fare receptacle that a single compartment device or a registering fare box was more desirable. This fact was made the basis of a paper read last year as a supplement to the report submitted the year previous. It was stated in that supplementary paper that the single compartment box had advantages over the quadruple type in that it was more easily handled, cost less for repairs, prevented the confusion of returns as between conductors and simplified the checking of cash receipts in the accounting department. In the latter respect alone there was a material saving effected in the cost of handling and checking returns.

In the use of the single compartment box it was pointed out that the practice followed was to assign a conductor a fare box with a movable cash receptacle as he was assigned to a car. This box he would use throughout the day, after having deposited therein an identification slip. If a man were relieved temporarily, such as at meal times, or for other reasons, or if his run should call for a swing, he would remove the fare box from the car and leave it with the receiver or clerk at the car house until he resumed his work. At the close of the man's day the cash receptacle would be removed from the box and sent to the cashier, an empty receptacle being put in its place. By giving conductors the same fare box every day most of them come to evince a sort of proprietary interest in them with result that the repair bills were kept to a minimum.

But just as the single compartment box is an improvement over the four-compartment device, there are many who believe that the registering fare box is superior to any form of locked receptacles. Opinions

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on this point do not all concur. That the principle is a good one is generally admitted but the rub comes in the lack of confidence in the accuracy and reliability of the mechanical devices which must be depended upon in the registering type of fare boxes. That there are boxes of this character which give satisfactory service cannot be denied but the operating and accounting men of some companies still look upon them as being in an experimental stage. One company which has tested about every type of registering fare box in the market and has more than 1,000 prepayment cars equipped with these devices is convinced of their usefulness. They enable the conductors to get at the change deposited as fares — after the fares are registered — thus eliminating the necessity of having on hand at the car houses large sums of the company's cash to be furnished to conductors for the purpose of making change and at the same time enable the conductor to make his returns in the larger coins or currency. In fact the introduction of a proper registering fare box would practically eliminate the Prepayment Fare Accounting problem in the sense that such a step would make feasible the resumption of accounting systems which were found effective and economical before the prepayment type of car made its appearance.

It might be well to add at this point that the registering fare boxes have reached their present state of development toward perfection despite a lack of co-operation on the part of the companies for whose use they are designed. To date the manufacturers have had to follow a sort of hit or miss policy because no two companies have adopted the same system of accounting and the demand for boxes has varied so, as to type or design, that the makers of the devices have had no set standard to work up to. If a uniform method of collecting and accounting for fares were adopted boxes could be designed to meet the conditions required and the problem would thereby be further simplified.

Respectfully submitted,

M. R. BOYLAN, *Chairman,*
H. J. DAVIES,
C. N. HUGGINS,
Special Committee.

Discussion of the Report of the Committee on Fares and Transfers

MR. SCHNEIDER:—We think that we ought to approach a passenger just as seldom as possible. If we can get his money out of him in the first instance, we think it is more desirable. We have some runs 117 miles long, both on local and limited service, and to go to that passenger at every five cent zone or even at every station would be a burden to him. We think

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it would become a nuisance to the passengers on the car to go to them more than once to get their fares. We have a little holder in the cars to hold our checks, so that we check up very closely. We think we ought to approach a passenger only once on a trip.

MR. CHERRY:— I think it would be very interesting to hear from any one who is an advocate of the zone system.

MR. TOWNLEY:— I do not wish to appear as a general advocate of the zone system but in order to bring out the points for discussion I might say a word. It is, of course, obvious that you don't want to annoy passengers by going to them any more frequently than you have to. If we were to consider only the passengers' convenience, there couldn't be any question about making one collection cover the entire trip. It is also obvious that as the length of the run increases the zone system becomes more burdensome but if you have a comparatively short system with two or three or five zones the burden is less, and the ease with which you can insure that the company will get all of the money collected is improved by the zone method. On a long trip, of course it is easier to sell transfers or checks but with a short trip of two or three zones the use of the check system becomes more burdensome. It has always seemed to me there was an argument in favor of the zone system for the short ride with a small number of zones, because of the ease of insuring that the conductors will turn in the money which they should.

MR. SCHNEIDER:— How would he collect through tickets on the zone system?

MR. TOWNLEY:— It is not always necessary to sell tickets, particularly where the run is a suburban one, passing through from three to five zones and terminating in a rural community.

MR. SCHNEIDER:—Well, it seems to me that in some of the larger cities traffic would be so heavy if the zones were short, as they are in interurban service (say two and a half miles), that a conductor very frequently would be unable to get around the second time.

MR. SHANNAHAN:— I am not here to defend the zone system for all situations, but there are some that perhaps it fits. We have a line in the South and a very con-

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siderable portion of the passengers are colored men, and you gentlemen who have had any dealings with that race know that if you collect for the entire ride, say 15 cents, you will never find a darkey paying but five, and yet he will always say that he has paid the whole fifteen. You are in one continual argument from start to finish, And I believe that there is no other feasible manner of treating that particular situation except through zone collections.

MR. CHERRY:— It is the Committee's idea to distinguish between the interurban and suburban. It might be feasible oftentimes to have zone collections on suburban lines where it would not be on interurban.

MR. COEN:— I move the adoption of the recommendation of the Committee.

(Motion duly seconded and carried.)

MR. CHERRY:— Recommendation (b) "Recommended that, where interurban roads enter a city over a foreign company's tracks and are required to report the number of city passengers carried, interurban tickets should have a city coupon which will be collected within the city limits as a second collection, in the same manner as city fares are collected."

MR. COEN:— Mr. Chairman, why not collect them all at once, the same as your recommendation (a). What is the difference? In Cleveland our car goes into the city as a city car; while the same crews handle it, collect the fares and so forth, the reports are made to the city company, the men are under the control of the city company. I see no reason in the world why there should be any other collection. There is a register there. Why cannot the fare be registered just as well when the suburban collection is made, and thus save considerable annoyance to the passenger?

MR. CHOATE:— We have the identical condition that the last gentleman referred to as objectionable, and we found it to work very satisfactorily. Our runs, however, are pretty long (sixty miles), and the city run being only a short one of about a mile. We sell all of our tickets in coupon form. We have to make an independent accounting to the foreign lines over which we operate. Therefore, we either take up cash and show it by the register or we have a coupon ticket cover-

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ing the district. This has been particularly attractive to our accounting department and it very much simplifies matters as our own check and the check of the auditor of the foreign lines to whom the report is also made, rarely show a difference. The plan is not considered an annoyance to our passengers at all.

MR. CLARK:—Where crews of the city company accept the suburban and interurban car at the city boundary and the city fare is five cents straight and no provision exists for ticket fares or ticket accounting, is it the intention of the Committee to burden the city companies with tickets?

Possibly our company is unique and what may appear a burden to us may be for the welfare of street railways at large. Interurban cars are taken over at the boundary and a five cent fare collected from each occupant at the time the car is surrendered to the city crews, and this car will pick up passengers while on the city streets collecting a five cent fare from each passenger.

MR. CHERRY:— The idea of the Committee in this instance was to simply keep the number of the city passengers distinct and register them separately from the city passengers whether by tickets or a five cent fare, whatever the city fare might be. The city company is not burdened with the coupon or the ticket, as I think it is common practice with the interurban companies to report to the city company the number of passengers carried, the city company does not care whether fare is paid by coupon or five cent cash fare.

MR. COEN:— Take our two terminals (Cleveland and Toledo). We operate at those two terminals on an entirely different basis. At one terminal the car becomes the city company's business, and at the other terminal it is a divided fare. Now, we collect our fares so far as the public is concerned the same at both terminals, and they are registered on a register providing for Cleveland, and a register providing for Toledo. But so far as the net result is concerned, the public is not interested in that. It is handled in an entirely different manner and very satisfactorily too.

MR. SCHNEIDER:— I did not notice the latter part of section (b) which states that a second collection should be made in

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the city. Now, I am absolutely opposed to that second collection. I did not catch that point. We only make the one collection either going into a city or going out and we find it expedites our business very much. I am really opposed to section (b) on account of the second collection.

(Motion made and seconded, that recommendation (b) be approved.)

MR. GLOVER:— I think that the second recommendation is at variance with the first, and for another reason, there is an objection to the second recommendation, it would increase the work of the accounting department, and make double the number of ticket coupons that would come in. It would double the number of tickets to be accounted for. I think the recommendation ought to be changed.

MR. COEN:— Mr. President, I will offer the amendment to the motion, that it be made to read as follows: "Recommended that where interurban roads enter a city over a foreign company's tracks, and are required to report the number of city passengers carried, interurban tickets should have a city coupon which will be collected at the same time as the interurban fare whenever practicable." Now, it seems to me that there may be cases wherein under your traffic contracts or otherwise that cannot be done, but where it is practicable it seems to me it should be done.

(Amendment accepted.)

MR. GLOVER:— That is the second coupon. Why would not one ticket answer the purpose just as well.

MR. SCHNEIDER:— Because you may have passengers that do not go to the extreme terminal.

MR. SHANNAHAN:—Answering your question, Mr. Glover, there are certain situations, contracts, which make it necessary. There was in the city of Washington that same situation.

MR. SCHNEIDER:— In our case the conductor turns the coupon into the city road.

MR. FORSE:— One of the speakers was outlining the plan used in Cleveland, which is one of our big interurban terminals. Indianapolis is likewise one of our largest interurban terminals, and none of the roads that enter into Indianapolis

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use the coupon. These roads have agreements with the city company whereby a certain amount is paid for each passenger brought into the city. Some of these passengers come in over long routes, originating probably in Ohio or in Illinois, a long distance from Indianapolis, and interline tickets are sold. The selling road sells through tickets to Indianapolis, and you put an additional burden upon the interurban roads if they are required to provide a separate coupon for the city trackage. It seems to me that in a recommendation of this kind we should not go on record as requiring all companies regardless of contractual relations to use a certain form of ticket. Even though the trackage rights are paid for at so much per passenger, the contract may yet specify no method, or a better method than the coupon arrangement, and for that reason I recommend that this plan be not adopted.

MR. BRUSH:— If that interurban car upon arrival at the country terminal, or at the city limits becomes to all intents and purposes a city car and is subject to city control, and has a register in it, and the city company is receiving its revenue on the basis of five cents on each passenger carried, it is absolutely essential that the city company either have a register in the car and register each passenger, or have the conductor make a note of the number of passengers who are coming into the car upon arrival at the city terminal. Some of these interurban cars have registers and some have not. This recommendation would be affected largely by the style of contract. Further than that, an inspector would have to have some means of knowing how many persons are supposed to be on the car. Without a register it would be impossible for him to do it. Whether or not this coupon which is suggested shall be attached to the through ticket, is torn off by the conductor at the time of the collection of his through ticket or not seems to me immaterial.

MR. HAMMOND:— I want to ask whether or not I am correct in the understanding that this does not apply to cases where cash fares are collected on cars.

MR. CHERRY:— It would apply in any case where a separate record of city passengers is required.

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MR. HAMMOND:— But there would be no ticket coupon turned in.

MR. CHERRY:—Well, I may be wrong in that. The idea of the Committee in taking the matter up was to have city fares registered separately. And owing to the fact that most people travel on tickets on interurban roads, we recommended that the city coupon be attached.

MR. HAMMOND:—Well, that would be in case no cash fare were accepted on the car; that it was all handled by ticket.

MR. CHERRY:—Yes, some of the members of the Committee thought that if a cash fare was paid it should be paid to the city limits and if the second collection of a cash fare be paid it should be made a city collection. The Committee itself had a good deal of argument on this thing and were not a unit by any means.

MR. HAMMOND:— I have in mind our particular case. The conductor counts the passengers and makes a record on a duplicate slip, one of which he turns in to us and the other to the city company at the end of his run. We have tickets and we also have cash fares.

MR. BOYLAN:— In answer to your question I would suggest that you collect the through fare into the city and use the passengers' identification check for the city fare.

MR. SWIFT:— I do not see that very much will be accomplished by this discussion because I presume that every suburban company operating over city lines is doing so under a contract, and certainly in a majority of these cases the contract would provide some method whereby the city company could ascertain for itself that it was receiving pay for every passenger that rode into the city. Now, inasmuch as the recommendation of this Association would not modify existing contracts, I don't see that anything will be accomplished whether the resolution is passed or not.

MR. FRANKLIN:— I would like to offer an amendment that this matter be referred back to the Committee and the Committee continued.

PRESIDENT SHANNAHAN:— The Chairman states, Mr. Franklin, in behalf of the Committee, that the members have fought it out in Committee and if they are to present any-

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thing which will have any chance of adoption by these two Associations they must have the help of the members present to determine what is the correct position. They have gone just as far as they can and hope that a vote may be had on this matter.

MR. FRANKLIN :— That is just what I have in view, they now have the advantage of having heard what has been said here to-day regarding this matter under discussion, and perhaps it would help them to arrive at something definite that will meet all of the conditions which have been set forth here.

MR. CHERRY :—Mr. President, I do not think it is out of place to say that all of these recommendations were gone over in the Committee, and we were not unanimous on a single one, and that is why we bring them to you, gentlemen. They are common operating points, we run against them every day, and you are the men to decide. We will take this matter back when we have heard arguments pro and con, but we do not know what the majority think is the best practice. The Committee has no feelings about amending or rejecting the recommendations but let us get some action, some positive action.

PRESIDENT SHANNAHAN :— Is there a second to Mr. Franklin's amendment?

(Motion duly seconded.)

PRESIDENT SHANNAHAN :—The vote will first be on Mr. Franklin's amendment which is to the effect that this recommendation go back to the Committee and the Committee be continued.

(Motion lost.)

PRESIDENT SHANNAHAN :—The vote is now on Mr. Coen's amendment to Mr. Schneider's motion. Will you state that, Mr. Coen, so that every one will understand?

MR. COEN :— I move that recommendation (b) be changed to read as follows: "Recommended that where interurban roads enter a city over a foreign company's tracks and are required to report the number of city passengers carried, interurban tickets should have a city coupon which will be collected at the same time as the interurban fare is collected, when practicable."

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PRESIDENT SHANNAHAN:—The vote, gentlemen, is on Mr. Schneider's motion as amended by Mr. Coen.

(Vote was thereupon taken and the Secretary announced a tie vote.)

PRESIDENT SHANNAHAN:—The Chair votes "aye."

(Motion carried.)

MR. CHERRY:—Recommendation (c): "Where a class register is used, that a hat check showing a destination and amount of fare be issued to passengers paying cash fare;

Where a register is not used, that a cash fare receipt showing destination and amount of fare paid be issued to passengers paying cash fare;

Where a class register is used, that tickets be registered at the full one-way cash value and passenger be given a hat check including destination and that fare has been paid by ticket;

Where a register is not used, that passengers tendering tickets receive a hat check indicating destination and the fact that fare has been paid by ticket.

That both cash fare receipt and hat checks be collected by conductor before passengers leave the train."

(Motion made and seconded that recommendation (c) be adopted.)

MR. BRUSH:— It is to be borne distinctly in mind that while these gentlemen who are operating in the Middle West, operating high-speed interurban cars, some of which come in over the city lines under more or less peculiar contracts, that in the East, to all intents and purposes, upon the arrival of a foreign car at a terminal at the city limits, it becomes the property of the city company, it is under the control of the city company in every way, shape and manner, operated by the motorman and conductor of the city company, and, so far as I know, where a foreign car enters a city nothing is accepted but cash fares. The company with which I am connected accepts the cars at the terminal, mans them and to all intents and purposes they are our cars. They are local cars picking up and letting off passengers the same as any other local cars on our line. We do not believe in hat checks, receipts or anything of the kind in confusing interurban business with

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city business. We segregate city business entirely. Under those circumstances our company could not vote in favor of this recommendation.

PRESIDENT SHANNAHAN:— Is there any further discussion? The vote then is on the adoption of recommendation (c) of the Committee.

(On vote being taken, the motion was defeated.)

MR. CHERRY:— Recommendation (d) "The Committee recommends that conductors be required to turn in tickets, cash fare receipts and hat checks at the end of each trip, cash to be turned in at the end of the run.

(Motion made and seconded that recommendation (d) be approved.)

MR. BRUSH:— May I suggest an amendment, after the word "hat checks;"— "where such exist, or where such are used." Making it generally applicable.

(Amendment accepted.)

MR. WELLS:— Mr. President, may I ask the Chairman of the Committee if this recommendation that the conductor be required to turn in his ticket at the end of each trip means at the end of each half trip, or round trip?

MR. CHERRY:— Round trip.

MR. WELLS:—That would apply to local conditions any way.

MR. CHERRY:—The Committee's idea was the full trip.

MR. PANTELL:— In that case then, it would require turning in on some trips in the middle of the road and some at both terminals. How about that? You would not get all of the conductors' trip reports in the evening from one point.

MR. CHERRY:—Well, there can be a box in the car or some station where they could be deposited in the box, and that box locked up. That is a matter of local conditions and ought to be worked out as a detail. Ordinarily the cars are brought back to some station at night, wherever that is.

MR. COEN:— Mr. President, the interpretation put on this recommendation by the Chairman of the Committee seems to me is exactly opposite to what it should be. The recommendation states that "At the end of each trip." I take it that that means, on our road for example, that if the crews run say from Cleveland to Sandusky, that two reports would be re-

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quired and not one, and if that was the meaning, that it shall be for the two trips, I would like to withdraw my motion.

MR. CHERRY:— I think it was the idea of the Committee to consider that as a round or complete trip.

MR. COEN:—The same place and back again?

MR. CHERRY:—Yes.

MR. CHOATE:—You did not intend to change any local conditions?

MR. CHERRY:— No.

MR. SCHNEIDER:— I think there is the same objection to this that we had to the previous resolution that was lost, in the fact that you ask the companies to turn in the hat checks. Now, the previous motion was undoubtedly lost on account of the last clause, that both cash fare receipts and hat checks be collected by the conductor before the passengers leave the car. We don't care to have hat checks turned in on our road.

(The motion was thereupon submitted to a vote and carried.)

MR. CHERRY:— Recommendation (e) "In order that more detailed information regarding traffic may be secured, the Committee is of the opinion that it is good practice to require conductors to furnish a separate trip sheet for each half trip."

(It was duly moved, seconded and carried that the foregoing recommendation be accepted.)

MR. CHERRY:— Recommendation "(f) The Committee believes that it is not good practice to permit conductors to sell any tickets on cars, particularly those which are sold at a rate lower than the cash fare rate and, therefore, recommends that, wherever possible, the sale of tickets be confined to officers, agents or other authorized persons other than conductors."

(Moved that the recommendation be adopted; duly seconded and carried.)

MR. CHERRY:— Recommendation "(g) The Committee recommends that the conductor in collecting fares; should do so beginning at the front of the train and working to the rear."

(A motion for adoption duly seconded.)

MR. ROCKWELL:— I think that is a point that is governed entirely by local conditions. I could not possibly follow it out. If I did I would lose 35 per cent. of the fares. We

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have seven different lines radiating from a central point, and although they are all suburban and interurban lines, nevertheless we have a large number of short riders, and at certain hours, morning and night, if our conductor did not commence to collect at the rear end he would certainly lose at least ten per cent. of his fares.

MR. FORSE:— In leaving Indianapolis, there are interurban cars that frequently pick up city passengers. The running time out of the city does not give the conductor sufficient time to work his car. In fact he does not usually finish until the car is several miles out in the country. Some passengers are inclined to take advantage of this fact by getting on downtown on the back platform and getting off when they get out into the residential district, before the conductor would have had time to work half way back through the car. I believe for that particular reason that this recommendation should not be adopted.

MR. SCHNEIDER:—We have similar conditions, but we keep our conductor on the back platform until the city limits are reached, and in that way if there is any local business the passenger has to pay when he goes out. The conductor begins interurban fare collections outside of the city limits.

MR. FORSE:— In other words he does not begin to collect at the front, he begins to collect at the back, the city people being on the back end?

MR. COEN:— Of course, it might happen that some times cars would go into the city instead of going out all the time. It strikes me that such a proposition is good practice. Though there are conditions on any roads that may require variance from it.

MR. BRUSH:— If a car handles its passengers as the gentleman suggests, that is, if the conductor remains on the rear platform collecting the fares as passengers leave the car, remaining in this position until arrival of the car at the city limits and then goes forward to the front end of the car and commences to collect his interurban fares working from the forward end of the car towards the rear end of the train it is more than likely that a considerable percentage of his passengers, at least all of those desiring to leave the car for a reasonable distance past the city limits, will leave the car while

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the conductor is at the forward end without paying their fare.

Surely a conductor could not collect an interurban car full of passengers in less than 5 minutes, which conservatively speaking would permit the car to go at least two or three miles. Therefore, under these conditions passengers desiring to evade their interurban fare would remain at the rear of the car and drop off the car just before the conductor reached them.

If the conductor on the contrary commenced to collect his fares at the rear of the train upon leaving the city limits, he would prevent anything of this kind.

MR. SCHNEIDER:— I just wish to say that we overcome all of that by having a front entrance car. I think that solves the whole proposition.

MR. DUFFY:— Mr. Chairman, I feel just the same as one of the previous speakers, that interurban cars operating out of the city in a great many cases handle city passengers, and if the conductors commence to collect at the front of the train or car they will lose fares. I have seen the conductors miss fares by so doing and I am not in favor of this recommendation.

MR. FRANKLIN:— I think it is clearly a question that should be left open. Local conditions clearly govern in a case of this kind and I hope that the motion will be lost.

(Thereupon the motion was submitted to a vote. Motion lost.)

MR. CHERRY:— Recommendation "(h) The Committee recommends that conductors be required to cancel tickets in the presence of passengers immediately after collecting same." The Committee realizes that that is a common rule, but we believe it is not lived up to, and we would like to have some definite action taken.

(Motion for adoption duly seconded and carried.)

MR. CHERRY:— The second part of this report was prepared by a subcommittee composed of Mr. Wood and Mr. Dempsey. I will ask Mr. Wood to read his part of the report.

(Appendix C of the report was then read by Mr. F. T. Wood.)

(Appendix D was then read by Mr. M. R. Boylan.)

PRESIDENT SHANNAHAN:— Mr. Sullivan has a very interesting device here that he has been good enough to bring along and which he will show us.

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(Mr. J. V. Sullivan here was called upon to exhibit a new form of "brother-in-law" or substitute bell which had been used by several conductors of the Chicago Railways Company to "beat" the regular register. It was thought this should be of interest to operating men as the device was very cleverly designed.)

MR. SULLIVAN:—We found this contrivance on one of our conductors a short time ago. It speaks for itself. He had it strapped above his right ankle, and when he worked the left foot and rang the bell he got the money. When he worked the right foot we got it. And at times he worked the left foot much more frequently than the right according to the testimony of witnesses in court.

MR. BRUSH:— I move the adoption of the report of the Committee on Fares and Transfers report as amended.

(Motion duly seconded and carried.)

PRESIDENT SHANNAHAN:—The next business to come before this meeting is the report of the Committee on a Statistical Unit for Car Operation, which will be read by Mr. C. H. Lahr.

REPORT OF THE JOINT COMMITTEE ON A STATISTICAL UNIT FOR CAR OPERATION

To the American Electric Railway Transportation and Traffic and the American Electric Railway Accountants' Associations:

GENTLEMEN.—At the meeting of the Executive Committee of the Transportation and Traffic Association, held in New York in November last, a resolution was passed as follows:

> "Moved, that the President appoint a Committee of three to investigate the subject of arriving at a proper unit for car operation and report at the next annual Convention, this Committee to co-operate with a similar committee from the Accountants' Association."

President Shannahan subsequently took up with President P. S. Young, of the Accountants' Association, the question of joint co-operation, and upon acquiescence this Committee was appointed. The event which determined the advisability of the appointment of such a Committee was a general discussion at the 1911 Convention of the various units in use and an apparent feeling that some new unit could be developed which would provide a more satisfactory means of comparison than those now generally in use.

Your Committee held a meeting during the period of the Mid-year Conference and developed there a general form of inquiry which was

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sent to member companies. This data sheet and accompanying letter are shown as Appendix A of this report. The responses from member companies have been generous in quantity, but an analysis of the information given does not afford sufficient data upon which to base recommendations for new statistical units and, in fact, fails to show any substantial demand for changes, although there does seem to be a very well defined sentiment that present comparative units could be improved upon.

Your Committee desires to lay before the members a synopsis of the replies received showing the number of companies using the different units and also presents an abstract of comments and suggestions received.

The Committee, as stated above, does not feel itself able to make any definite recommendations at this time, but would respectfully suggest that the subject be continued and that the member companies give to the Association, through discussion at the Convention, the benefit of their experience and suggestions. The Committee feels that in this way something may be developed which will serve as a guide and possibly lead to a line of action that will afford the co-operating Associations an opportunity to decide upon some unit that will be satisfactory under any and all conditions. It would appear that if such a conclusion to the work of this Committee can be brought about, it would in many ways be of substantial benefit to the members of our Association.

Respectfully submitted,

C. H. LAHR, *Co-Chairman,*
C. B. BUCHANAN, *Co-Chairman,*
E. L. KASEMEIER,
C. S. MITCHELL,
NATHAN H. DANIELS, JR.,
J. A. EMERY,

Joint Committee on a Statistical Unit for Car Operation.

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APPENDIX A

JOINT COMMITTEE ON A STATISTICAL UNIT FOR CAR OPERATION

To the Member Companies:

GENTLEMEN.— Enclosed is a short Data Sheet of this Committee which we trust you will be good enough to execute and return promptly.

As some of the changes suggested in statistical units are radical, it is urgently requested that all companies assist the Committee by submitting their ideas in full. The Committee is not prepared to recommend departures from the established units of the car mile and car hour unless it is assured that the companies need additional units in order to analyze their operations more closely. Whatever action is taken by the Committee will represent the practice of the great majority of companies. In order that it may do this, it is desirable that the companies communicate promptly with the Committee.

The Committee wishes, in other words, to get expressions of opinion both for and against the adoption of new units, particularly where such expressions are based upon actual experience.

Very truly yours,

C. H. LAHR, *Co-Chairman,*
C. B. BUCHANAN, *Co-Chairman,*
E. L. KASEMEIER,
C. S. MITCHELL,
N. H. DANIELS, JR.,
J. A. EMERY,
Committee.

March 13, 1912.

AMERICAN ELECTRIC RAILWAY ACCOUNTANTS' ASSOCIATION

AMERICAN ELECTRIC RAILWAY TRANSPORTATION AND TRAFFIC ASSOCIATION

JOINT COMMITTEE ON A STATISTICAL UNIT FOR CAR OPERATION

Data Sheet No. 87. March 13, 1912.

Name of Company.....
City..... State.....
Do you operate interurban or city service?.....
Do you operate a freight or express service?.....
What statistical unit are you using in connection with your freight and express service? .....
.....
What statistical unit are you using in your passenger service?.....
.....
Have the above units proved satisfactory?.....
If not, state reasons why?.....
.....
Average number of motor cars operated daily.....
Average number of trailer cars operated daily.....
What units would you recommend for general adoption, and give reasons.....
.....
.....
(Signed).....
(Title).....
Date.....

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APPENDIX B

SYNOPSIS OF REPLIES TO DATA SHEET NO. 87

Joint Committee on a Statistical Unit for Car Operation
American Electric Railway Accountants' Association
American Electric Railway Transportation and Traffic Association
March 13, 1912.

UNITS USED FOR COMPARATIVE PURPOSES IN EXPRESS AND FREIGHT TRAFFIC

Units Used	No. of Companies Reporting
Car mile	38
Car hour	1
Car mile and car hour	16
Ton mile	11
Car mile and ton mile	3
Car mile, ton mile, motor car hour	1
Car mile, car hour and ton mile	1
Pound mile	1
Train mile (freight)	1

UNITS USED FOR COMPARATIVE PURPOSES IN PASSENGER TRAFFIC

Units Used	No. of Companies Reporting
Car mile	58
Car hour	1
Car mile and car hour	80
Car day (18 hours)	1
Car day	2
Passenger mile	2
Car mile, car hour and car day	3
Car mile and car day	1
Car mile and passenger mile	1
Car mile, car hour and passenger track mile	1
Car hour, car mile and seat mile	1

SUGGESTED UNITS AND ABSTRACT OF REMARKS

Car hour	3	companies
Car mile	28	"
Car hour and car mile	24	"
Seat mile	14	"
Seat hour	1	"
Car mile, car hour and seat mile	3	"

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SUGGESTED UNITS AND ABSTRACT OF REMARKS — (*Continued*).

Car mile, car hour, car trip.....	1	companies
Ton mile (for freight and express)....	12	"
Car mile for carload freight and ton mile for less than car load freight.....	1	"
Car mile, car hour, motor mile, seat mile.	1	"

DETAILS OF OTHER SUGGESTIONS AND REMARKS

City Lines

Recommend revenue car mile, revenue car hour, revenue passenger, the ride; by "the ride" we mean earnings, cost of operation, etc., divided by the number of rides, which include fares, deadheads and transfers, to ascertain amount per ride.

Recommend car mile unit for roads operating one car passenger trains only, but for all purposes of passenger and express traffic, regardless of number of cars in train, the car hour unit would be more satisfactory.

In addition to car mile, car hour and kw-hour, recommend car seat offered, rate of fare for one passenger, and in making traffic curves it is necessary to show seats furnished and passengers carried per trip. Car mile and car hour are not satisfactory on account of difference in seating capacity of cars. (In making traffic curves we have to show seats offered, which information has to be worked up at time curves are made.)

Recommend car mile; have no lay-overs and car miles run actually represent work done.

Prefer car mile unit; easily adapted to repair shop records.

Recommend car mile unit; expedient to analyze street railway operation thoroughly; periodic use of seat mile, ton mile and car hour units recommended.

Have a few statements based on seat miles and think this unit useful where cars of various capacities are used. Seat hour might also be used, but we have not considered this as yet.

Recommend car hour; car mile is very misleading. For instance a company may make very poor headway, hence high earnings and expenses per mile. For striking example of the car mile, see Public Service report, 2nd Dist., in complaint of the City of Ithaca vs. Ithaca Street Railway Co., comparison of earnings and expenses with 20 other roads in State of New York.

Present units answer with other refinements in more detailed analysis, at least for small lines.

Prefer ton mile unit for cost of power, track and rolling stock maintenance, on account various weights of cars.

Recommend car mile and car hour units for systems strictly urban.

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Ton mile more useful for interurban roads with heavy freight traffic and conditions which approach those of steam roads.

In our service (elevated and subway) the cost per car mile furnishes us the most satisfactory statistical results.

Our conditions vary so much from American Companies of similar size or larger, that we have found it practically impossible to make a comparison with these roads by either of the units we use (car mile and car hour) and we do not know that the seat miles would help us much. We have 5 different classes of ticket fares as well as cash fares and this reduces our average fare out of all proportion to the average American Company. We also operate a number of different type and size of motor cars, together with a large number of smaller trailer cars, and in summer we transfer to a large number of purely open cars, having double the accommodation of the same length of car in winter. These conditions make it so that under almost any unit a comparison could only be made with any degree of accuracy of the earnings on one particular route at different periods. Even with the seat mile unit, which might take care of the different sized cars, we could not compare one route where the maximum traffic is carried during hours when a cheap limited ticket can be used with another route upon which the maximum traffic for a different locality is during hours when only the regular ticket is valid. We, therefore, use our two units simply as a guide and to compare a route with itself and rely chiefly upon counts of traffic made upon the streets of actual conditions to regulate the service required. (City Company, Canadian.)

Interurban Lines

Do not recommend additional detailed data.

Recommend mileage; seems most logical from all standpoints.

Prefer car mile. The expense of analysis of freight statistics on ton mile basis does not seem warranted, considering ultimate value of same.

Recommend car hour, ton mile, car mile. First two would make good units if companies would go into detail to get figures.

Believe ton mile unit is valuable in establishing rates.

City and Interurban Lines

Recommend car mile and tax mile for freight and car mile and car hour for passenger service.

Prefer car mileage basis. Think it would be impossible to estimate passengers in any other way.

Suggest car mile and car hour. Car mile unit is more closely related to earnings and expenses than any other unit, and can therefore be more generally applied. The car hour unit is very satisfactory in apportioning certain expenses where speed is a controlling factor.

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So far car mile unit seems only basis and until satisfactory method of measuring power consumption is devised, know of no more satisfactory unit on account of difference in weight and speed.

Ton mile about best, although too much clerical work required for freight, account of varying number of trailers.

Suggest car mile and car hour, as it is easier to compile, especially on smaller systems.

Prefer car mile, car hour, seat mile, ton mile. Think we should have car weight and capacity unit also.

Suggest pound mile for freight or express. Car mile in passenger service.

Car mile and car hour are best for passenger service and freight car mile is best for freight service. We use freight train mile, as we do not consider that the additional work of keeping mileage on freight car mile basis is warranted on this particular system.

Ton mile, in order to give fair bases of comparison between cars of different size and weight.

Car mile and car hour; using both units on account of variation of speed per hour, as no other unit is suggested, that is more applicable to car operation.

Prefer per seat passenger mile. Reason obvious. This department's business (passenger) consists of transporting a person at an average of 150 lbs. Car mile or car hour not satisfactory on account of the disparity of the size, weight and capacity of cars.

Recommend passenger seat mile. Think we can derive more universal comparisons from it than car hour or car mile, because of different sizes of cars for miles and different speeds for hours.

Believe both car mile and car hour should be adhered to, as in some cases one is better than the other and under all conditions both are very good.

In reference to your request for an expression of our opinion on units, we are submitting herewith the following report, showing a comparison of the cost per car mile and per mile of track for track maintenance on four different interurban roads:

COMPARISON OF COST PER CAR MILE AND PER MILE OF TRACK FOR TRACK MAINTENANCE

Road	Car miles op.rated	Exp. 1 to 16 inc. 19 per car mile	Miles Track	Exp. 1 to 16 inc. 19 per Mile of track per year
1.....	464,300	2.90¢	26.6	$506.00
2.....	1,899,500	1.97	65.2	573.00
3.....	5,131,000	1.16	97.5	610.00
4.....	820,400	2.11	31.1	556.00

"I have studied over your note relative to the cost per car mile for maintenance of track and arrange the above figures to show that

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while our maintenance is about 42 per cent. higher than the average of the four roads shown, yet compared with the other items, is not far out of place. I do not think that a car mileage basis is a proper method on which to determine whether a section of track is costing too much or too little to maintain.

"I base my opinion on the following facts: The principal requisites for maintaining a good smooth and safe track are, 1st, good drainage; 2nd, good ballast; 3rd, good ties, well tamped and surfaced, and good rails and fastenings.

"It costs just as much to properly drain and keep drained a section of track over which 10,000 car miles are run as it does to run 100,000 miles over the same section. The same is to quite an extent true of ballast. The ties rot out just as quickly in one case as in the other. Track bolts rust and when being tightened break and have to be replaced about as fast on the road that runs a few miles as on the one that runs many. It is necessary to keep the track in just as safe condition and just about as essential to the service that the track be kept smooth when hourly service is run with one fast and heavy car, such as ours, as it is when running trains of two or more cars. Our cars are as heavy as on the other roads named.

"While it is true that a little more labor is required to keep a track surfaced where a great number of cars are run than where only a few are operated, yet it must be admitted that the greatest difference in cost is on wear and tear of rails and special work. For the above reasons it seems to me that the cost per mile of track per year is a fairer and more proper method of arriving at the cost of track maintenance for comparative purposes. You will note that on this basis our track maintenance is lower than on the three interurban roads named.

"It seems to me that the report is fairly sound logically and it sets forth one of the reasons why we think the car mileage basis alone is not always correct when used for comparative purposes."

(Motion made that report be received and the Committee continued. Seconded.)

Discussion of the Report on a Statistical Unit for Car Operation

MR. HARVIE:— Mr. President, in looking over the report of this Committee it appears to me that the Committee should feel very much gratified at the replies received to the inquiry sent out, as upwards of 60 per cent. of the companies replying have made recommendations of units. They have put in everything, to be sure, from the old car mile and car hour down to seat mile, ton mile and pound mile, for freight. Perhaps the number

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of those suggestions has overwhelmed the Committee, but certainly a matter like this in which both of the Associations are so much interested, can be worked out jointly and a definite conclusion reached. In line with this I would call your attention to the following. The cost of operation in part as shown by our operating accounts reflects distinctly the varying phases of railway operation, and the entire subject, as I see it, divides itself into practically two classes, namely, maintenance which is dependent on the weight of cars, the scheduled speed and the mileage; and the "operation," if I may call it such, which includes the traffic and general expense, and which is dependent primarily on the business done and the service given. This would indicate that more than one unit might be required. Two units may be or may not be necessary, but undoubtedly one unit is the thing to strive for.

Now, at the risk of adding an additional suggestion to those already before the Committee, I would like to suggest a unit which occurs to me; it sounds rather formidable, I know, but I don't believe that it is as involved as it appears; namely, cost "per ton mile per car hour." Such a unit, I believe with the assistance of our auditors, who are primarily interested in producing the results required cheaply and with as little inconvenience as possible, can be worked out on a very simple basis, and I would like to leave the suggested unit with the Committee as expressing as nearly as I am able to at the present time a unit which will have in it all the varying quantities to be reckoned with in railway service.

PRESIDENT SHANNAHAN:—The question is on the adoption all of the motion to continue the Committee.

(Motion carried.)

PRESIDENT SHANNAHAN:—The Secretary desires you all to call for your mail and telegrams and I also wish to state that the Amercian Association meeting this afternoon is open, and it is the hope of the Executive Officers that you will all attend.

The Chair now announces as the Committee on Nominations: Messrs. J. K. Choate, George W. Parker and George L. Radcliffe.

(Thereupon the meeting was declared adjourned until Thursday, October 10, at 9:30 A. M.)

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THURSDAY MORNING SESSION

OCTOBER 10, 1912

JOINT MEETING TRANSPORTATION AND TRAFFIC AND CLAIM AGENTS' ASSOCIATIONS, BLUEROOM, SADDLE AND SIRLOIN CLUB.

Vice-President Brush called the meeting to order at 10:20 A. M.

CHAIRMAN BRUSH:—This is a joint meeting of the Transportation and Traffic Association and the Claim Agents' Association, and it is extremely important that we transact our business with as much dispatch as is proper, giving due consideration of course, to the importance of the subjects to be considered, as there is a great deal to be done between now and one o'clock. Mr. Bruce Cameron will present the report of the Committee on Training of Transportation Employees as the first order of business.

REPORT OF THE COMMITTEE ON TRAINING OF TRANSPORTATION EMPLOYEES

To the American Electric Railway Transportation and Traffic Association:

GENTLEMEN.— The Committee on Training of Transportation Employees begs to submit herewith its report.

INSTRUCTIONS

Acting under instructions of the Executive Committee, the following subjects have been considered:

(a) The development of uniform blanks for use during the breaking-in period.

(b) The minimum breaking-in period for both city and interurban lines.

(c) The development of forms for permanent record of employees.

(d) A study of State or Municipal regulations which affect the employment of trainmen.

(e) Merit and Demerit System.

(f) The matter of the payment of bonuses to trainmen.

(g) Training of employees for interurban work.

HISTORY

Preparatory to the actual work of carrying out the instructions noted above, your Committee made a study of the work of the previous committees which have considered the subject of the training of transportation employees and hereto appends a brief resumé of the recommendations of these Committees.

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The 1908 Committee recommended that the operating rules be standardized which would, of itself, tend to a standardization of the system for the training of employees. This Committee further recomcant to pass the examination which follows.

A height limit.

A weight limit.

The employment of men having experience in similar service if record is satisfactory.

That men without steam railroad experience be employed.

That the employees consist of American citizens, excepting negroes, and that Chinese and Japanese be not employed.

The adoption of standard form of application blanks, providing for releases and photographs of applicant, the Committee submitting such recommended forms.

A standard for sight, color sense and hearing test, together with medical examination according to forms submitted.

The head of Transportation Department or properly delegated official to outline to the applicant the duties and requirements of the position he is about to accept.

That applicant then be assigned to a especially selected motorman or conductor, as the case may be, for instruction on car.

That the length of service under the instructor be an indefinite period to be determined by the instructor and the ability of the applicant to pass the examination which follows.

That applicant receive both oral and written examinations, the results of which shall form a part of the employee's permanent record.

That city men should not be promoted to interurban service or city extra men used for extra work in interurban service.

That traveling instructors be employed to follow up new men.

That educational work be conducted among the men by means of lectures and talks at stated intervals by departmental heads.

That the education of each man be followed up consistently and constantly.

That the merit and demerit system of discipline be applied.

The 1909 Committee, in their report, called attention to the necessity of careful selection, need of careful training, and made comparisons of various forms of discipline and recommended welfare and pension plans tending to make the service more attractive and thus raise the standard of applicants.

At the 1909 Convention, the Association adopted the forms offered in the 1908 report, but did not adopt that portion of the report referring to the merit and demerit system.

The 1910 Committee made recommendations that further consideration of the subject provide for the development of a set of rules and forms covering the breaking-in period and outlining the following procedure in training:

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First: That the motorman should be instructed in the rules of the Company and in the actual operation of the car in service; that he also be taught the general characteristics of electric equipment by means of a skeleton car or by work in the shop or pit.

Second: That motormen be given sufficient education along these lines to enable them to locate and remedy minor troubles.

Third: That a probationary period of thirty days be established at the conclusion of which the applicant should undergo a written examination.

A discussion on the floor of the Convention of the above reports brought out a number of subjects worthy of discussion, among which might be noted the following:

Need of retaining all records.
Six months probation periods.
Physical examination following army practice.
Extended shop experience.
Need of written examination.
Development of a spirit of pride in the work among the men.
Training in the use of the telephone.
Some of these subjects being touched upon in this report.

RECOMMENDATIONS AND PRACTICE COMPARED

A comparison of the actual practices of the member companies with the recommendations of the previous Committees indicates a tendency to adhere to the standards suggested by the Committees, examples of the trend toward standardization being shown in the close adherence to the 1908 Committee's recommendation as to age limit, height and weight of motormen and conductors.

The 1908 Committee's recommendations prescribe age limits of from 21 to 40 years, while the development from records of companies submitted show that the average age limits on city lines is 21.5 years as a minimum to 40.4 years as a maximum. Similar comparison of age limits on interurban lines, 21.8 years as a minimum and 39.6 years as a maximum.

Close adherence to the Committee's recommended height limit of 5 feet 6 inches as a minimum is shown by the general average of city companies of 5 feet 6⅜ inches minimum and of interurban lines of 5 feet 6½ inches minimum.

The recommended minimum weight for conductors of 130 lb. and 150 lb. for motormen is closely followed, city companies averaging 140 lb. minimum for conductors and 150 lb. minimum for motormen. The difference between 130 and 140 lb. is due to the higher minimum as maintained by companies which operate from 50 to 100 cars, other classes coming very close to the minimum recommended by the Committee.

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DATA SHEET

Your Committee, after reviewing the work already accomplished by preceding Committees, developed an inquiry sheet requesting information concerning organization of Transportation Department, the Selection of Trainmen, Statistics of Length of Service and Supervisory Force. This data sheet, copy of which is appended to this report as Appendix A, was sent to all Member Companies, 112 companies making reply. On the information so obtained the Committee has based its report.

The information furnished by the Member Companies has been analyzed and for comparative purposes the analysis classifies the companies reporting into city and interurban classes, city lines being further sub-divided into six groups.

Group A, roads operating 50 cars and under.
Group B, roads operating 50 to 100 cars.
Group C, roads operating 100 to 250 cars.
Group D, roads operating 250 to 500 cars.
Group E, roads operating 500 to 1,000 cars.
Group F, roads operating 1,000 cars and over.
Group G, interurban roads.

A study of the analysis follows.

ORGANIZATION OF TRANSPORTATION DEPARTMENT

Replies to the request for a chart showing organization of Transportation Department from companies operating 50 cars and under, naturally indicate less sharply defined organizations than the replies from companies operating a large number of cars. The tendency on the smaller roads is to make the operating force responsible for the work of such other departments as are most closely related to the Transportation Department. As the companies grow in size, the duties of the Transportation Department organization become more clearly defined, and in companies of the largest size the organization becomes highly specialized. Typical organization charts are shown in Appendix B.

SELECTION OF TRAINMEN

Selection of trainmen and records of qualifications for employment as trainmen relating to age limits, height and weight are covered in the comparison of previous committee recommendations with reported practices of the Member Companies. Replies as to the physical condition, color sense and hearing requirements indicate that ability to pass a good physical examination is deemed of more importance by city companies than sight, color sense and hearing, while reports from interurban companies indicate that examination for sight, color, sense and hearing are also considered essential on interurban lines.

To the inquiry "Have you difficulty in securing a sufficient number of men with these qualifications?" a majority of the Companies re-

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port that they do not have difficulty in securing sufficient men with the necessary qualifications. As a rule Companies reporting difficulty in securing men are those having a narrow range in age limits or an extraordinary height or weight limit, one company reporting that only men between 22 and 28 years of age are employed. A number of companies attribute the scarcity of men measuring up to the required standard to the condition of the labor market. There is apparently a wide variation in the requisites in the selection of trainmen, the tendency being to multiply the requirements as the company grows in size. This tendency doubtless arises from the fact that the volume of business handled in employing new men calls for organized methods where the amount of work justifies the establishment of a regular employment bureau with the natural result that more time and attention follows where the work is thus specialized. While the methods adopted may vary, it is nevertheless apparent that such variations should not exist in the requirements themselves, for the character of the work to be done is pretty much the same everywhere and the type of man to perform it should be equally a constant.

INSTRUCTION OF TRAINMEN

Only a limited proportion of the Companies reporting state that they give school room instruction, a number reporting preliminary instruction to student before placing on the car for actual practice. The use of the school car is apparently limited to few companies, the practice in most cases being to instruct the student on cars running in daily service.

AMOUNT OF INSTRUCTION

There appears to be a wide latitude in what is considered to be a proper length of time for a student to be under instruction. This variation seems reasonable, however, when we consider the degree of alertness and efficiency necessary to properly operate a car through congested city streets or at high speed in interurban service as compared with the conditions obtaining in smaller places.

NUMBER OF INSTRUCTORS

The general tendency seems to be toward the use of several instructors in the training of a new employee rather than placing his instruction in the hands of one man. While a number of instructors are utilized successfully for a single individual, it seems preferable that at least the fundamentals be taught the prospective trainmen by one instructor as that instructor can be made more responsible for covering the entire ground than when this responsibility is divided among a number of instructors. Out of 106 companies answering this question, 77 per cent. report the use of more than one instructor.

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EXAMINATIONS

Examination of the trainmen after the breaking-in period is oral on a majority of the roads reporting with a goodly number requiring both oral and written examination; if an attempt is made to cover in a written examination immediately after the breaking-in period the various details involved in a trainman's work few will be found who can successfully pass a rigid examination; if less than a rigid examination is accepted only certain fundmentals may be covered leaving the details with an insufficient check to establish the individual's familiarity with them. It would seem preferable that a rather complete oral examination be conducted at intervals following the completion of the breaking-in period followed by a written examination at a later period by which time the trainman may have been able to absorb the previous details required. The tabulated replies to this subject of Instruction appear as Appendix C.

FINAL APPROVAL

From replies received final approval of the new trainman seems to be in most cases the duty of the highest ranking official of the Transportation Department dependent on the size of the Company. Uniformity seems desirable for which reason this work should be left to a single individual if possible.

PROBATIONAL PERIOD

A majority of companies report no probationary period, the general practice being to put the new employee to work and decide as to his fitness by subsequent observations. As an impetus to diligent attention probationary service is of value. If an employee realizes that it is up to him to make good on the job and that he is given a reasonable length of time to demonstrate his fitness therefor, he is more liable to show interest than when railroaded into a permanent position.

SUPERVISION OF TRAINMAN

A majority of the city companies report that the Supervision of Trainmen in the discharge of their duties is performed by the Supervisors and a uniformed street force. On interurban lines much of the trainmen's work comes under the observation of the train master and dispatcher but few companies reporting definite methods.

FOLLOW-UP SYSTEM

There appears to be a lack of "follow-up" system. This results in erratic treatment and violations, the latter developing ultimately into "habits" which are detrimental to efficient service. That system is the best which checks itself to insure against lax methods dependent upon individual conception of subordinate officials. The general opinion prevails that the trainmen should not be reprimanded while on duty or at least not in the hearing of passengers.

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CONTINUAL VIOLATORS

The practice of reporting violators to the Superintendent is very generally observed. The treatment of continual violators of instructions varies greatly, a number of roads remand the violator for further instruction, compelling him to break in again under an instructor while others require him to appear before the general manager or other official empowered with authority to discharge. Replies concerning supervision of trainmen are attached as Appendix D.

HANDLING OF TRAINMEN

The disciplining of trainmen by suspension prevails on a majority of roads; placing men on the extra list, is another form of discipline in vogue.

MERIT AND DEMERIT SYSTEM

From replies received it is apparent that up to the present time the Merit and Demerit system has not been adopted by many companies as a method of applying discipline. The results reported by companies using it vary greatly as to results obtained. One of the greatest values of the Merit and Demerit system arises in its furnishing a complete operating record and in giving complete knowledge of an employee's performance not obtainable in any other way. The policy of many companies is to discipline by means of suspension. Whether proper discipline can be maintained without suspension is a mooted question. Much value is apparently placed on the "heart to heart" talk between the official and the employee, a number of companies commenting on this form of discipline.

APPLICATION OF DISCIPLINE

On a majority of roads the application of discipline rests with the Superintendent who also makes discharges. Few roads report having a schedule of penalties for infraction of rules.

RE-EMPLOYMENT

There appears to be a difference of opinion as to whether men should be re-employed after once being discharged, a number of companies reporting that they have no definite ruling, each individual case being considered in the light of the employee's previous record. The influence exerted by the discharge of an employee extends beyond the employee himself and effects very often the organization from which he is separated. For this reason authority to discharge should be vested in some official (in a large company in a commission) sufficiently broad-gauged to interpret evidence and appreciate the effect which hasty action produces. A tabulation of replies relative to Handling of Trainmen is appended as Appendix E.

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BONUS SYSTEMS

The giving of bonuses as a reward for satisfactory service has not become general practice, a number of roads however reporting various methods of encouraging meritorious work, one giving cash prizes for the best papers written by employees on accident prevention, while another reports a division among the employees of balance from damage fund when the cost of accidents falls below a certain amount. The practice of furnishing free uniforms is restricted to comparatively few companies. Benefit associations are in operation on a large number of roads and are increasing. A number of companies are pensioning old employees but few as yet have added the insurance feature. A tabulation of replies relative to Bonus Systems is attached as Appendix F.

RECORDS

A complete exhibit of blanks used in the selection of, appointment, assignment and instruction of new men has been collected and is available for inspection by the members.

LAWS AND REGULATIONS

A number of companies submitted copies of city and state laws having to do with the employment and service of trainmen and a digest of these laws is obtainable at the office of the Secretary.

STATISTICS AND LENGTH OF SERVICE

In the development of information concerning length of service of trainmen the Committee has been greatly hampered by the lack of complete data, a number of companies having apparently not given this subject the attention it deserves. Failure to give complete information made it necessary to eliminate from the analysis all companies excepting those making full reports. Careful attention is directed to the figures presented in Appendix G. It will be noted that the Group F. roads lose by resignation and discharge 91.2 per cent. as compared with the total number employed per year while at the same time the Group F. roads show 59.40 per cent. of their men in service over five years, indicating the service losses are confined principally to the new men.

The difference between city and interurban conditions is shown by the fact that only 58.2 per cent. are lost by resignation and discharge on the interurban lines, as compared with 88.8 per cent. lost in a similar manner by the city lines. The higher percentage of men in city service over five years as compared with interurban service is probably due to the fact that the interurbans are a comparatively new institution.

SUPERVISORY FORCE

A gratifying number of companies report the promotion of men from the ranks to supervisory positions. The qualifications most frequently specified are good character, good appearance, familiarity with the duties required and executive ability. The training of the supervisory

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force seems to fall in most cases upon the Superintendent. Inquiries as to methods of training the supervisory force were too often answered by "No special training," the general method of following up work of the supervisory force consists in personal observation of their work by the Superintendent. No satisfactory training of platform men can be expected if the education of the supervisory force is neglected, special training of the supervisory force is just as necessary and essential as is that of the trainmen.

CONCLUSIONS

SELECTION

Your Committee after consideration of the methods pursued in the selection, instruction, supervision and disciplining of trainmen submit the following definite conclusions:

Too many new men are hired each year; due to one or more of the following causes:

(a) *Careless Selection:* This is shown by the fact that 30.4 per cent. of men employed either do not qualify or are dismissed within six months.

(b) *Incomplete Training:* Statistics show that a large proportion of the accidents costing $100 or more to settle are caused by the new and untrained employee. A high percentage of rule violation by untrained employees is due to their lack of knowledge of such rules.

(c) *Lack of Encouragement:* A lack of personal interest in the new trainman is shown by the fact that 21 per cent. of them resign during the first six months.

(d) *Too Much Punishment:* Too much punishment and not enough education are responsible for many men leaving the service. This is apparent from the fact that 31.3 per cent. of the men resign or are dismissed during the first six months.

INSTRUCTION

(a) *Uniform Standard of Instruction:* There should be uniformity of training. It is best secured by student receiving fundamental instruction from one instructor only. Training course should be carefully worked out and instructors required to adhere to it.

(b) *Probationary Period:* A probationary period of at least sixty days is deemed advisable at which time a re-examination of the employee should take place.

SUPERVISION

(a) *Follow Up Methods:* Close observation of the work of new trainmen is necessary with systematic methods of ascertaining and correcting weaknesses and "habits."

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DISCIPLINE

(a) *Suspensions:* Suspension should be avoided whenever possible and should be administered, if at all, for major offenses only. Minor discipline should be limited to extra list service not exceeding three days. Suspension of an employee should terminate in or include a visit to the official having power to discharge.

This section was amended at Convention to read as follows:

(a) *Suspensions:* Suspension should be avoided.

(b) *Dismissal:* Dismissal should be by an official not in daily contact with the men, on roads which utilize over 500 employees, and by the general operating official on roads of smaller size, preferably an executive officer.

This section was amended at Convention to read as follows:

(b) *Dismissals:* Dismissals should be approved by an official not in daily contact with the men.

(c) *No Re-employment.* Dismissal should only be administered as a last resort and with no hope of re-employment.

This section was amended at Convention to read as follows:

(c) *No Re-employment:* Dismissals should only be administered as a last resort.

(d) *Annual Adjustment of Record:* Records of employees should be systematically examined at stated intervals and entry made to indicate the general character of service rendered by the employee during the period covered. This to be supplemented annually by a summary which indicates operating efficiency for the year.

WELFARE

(a) *Hours of Service for Regular Men:* Hours of service should be made as near ten hours in twelve as can be done with due regard to traffic requirements taking into account also the welfare of relief crews and extra men.

(b) *Relief Crew:* Work of relief crews should be restricted to not over ten hours work to be completed in fifteen hours, such crews should have first chance in order of seniority to fill regular runs.

(c) *Selection of Runs:* Selection of runs should be made by trainmen in order of seniority.

(d) *Extra Men:* Extra men should work on a rotating daily list.

(e) *Surroundings:* Work should be made attractive by good quarters with sanitary arrangements, sick benefits and insurance, together with pensions whenever possible.

SUPERVISORY FORCE

(a) *Selection:* Selection for supervisory positions should be made from the ranks wherever possible as a recognition of good service, as encouragement to fellow employees, and from the value of knowledge already gained concerning local methods of operation.

(b) *Examination:* Oral and written examination covering the duties about to be assumed should take place before appointment.

(c) *Conferences:* Monthly conferences should be held with the head

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operating officials in order that broad views be established regarding management of men and operating requirements.

(d) *Teachings:* The supervisory official should be taught courtesy, punctuality, loyalty, diligence and enthusiasm by superiors, he should have it thoroughly inculcated in him that the greatest crime is to be unfair to a subordinate.

(e) *Follow-Up Methods:* Insufficient attention seems to be paid to following up the work of supervisory officials, this practice being largely limited to platform employees.

The sphere of influence of supervisory officials is so extended that an intimate knowledge of their methods should be had with the view to correcting errors of omission and commission. This is even more important than in the case of trainmen themselves. That method best suited to local conditions should be the one adopted by individual companies.

(f) *Judgment of Work:* The percentage of men lost each year is one criterion of his work. The supervising official who frequently changes men is handicapped by the poor work of inexperienced employees and suffers from disloyalty and lack of team work by his platform force. The work of the supervisory official is also judged by public opinion of the divisional operation, if the public do not complain of the service and cash returns and expenses are satisfactory the supervisory official has placed many points to his credit.

Your Committee concludes this report with a request for careful and continued consideration of the subject, and calls particular attention to the necessity for eliminating antiquated modes of discipline and the adoption of such methods of dealing with the employee as will develop to the greatest extent, that feeling of satisfaction and security in the job which makes for contentment and efficiency.

These fundamentals are of vital importance and can be secured only by conscientious training and treatment of the individual unit. The thoroughness with which this is accomplished determines the degree of success in the broader principles of policy and management.

Your Committee feels under obligation to the former Chairman of the Committee, Mr. J. W. Brown, and to the Secretary of this Association, Mr. H. C. Donecker, for their valuable assistance, and to the member companies for their sympathetic response in forwarding the valuable data which form the basis for this report.

Your Committee has also co-operated with a Committee from our affiliated Claim Agents' Association, which Committee will submit a report in manuscript.

R. E. DANFORTH, *Chairman.*
C. E. LEARNED,
J. T. CRABBS,
BRUCE CAMERON,
C. B. WELLS,
C. S. KRICK,
M. J. FERON,

Committee on Training of Transportation Employees.

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APPENDIX A

BRUCE CAMERON, St. Louis, Mo.
C. B. WELLS, Denver, Colo.
C. E. LEARNED, Boston, Mass.
M. J. FERON, Chicago, Ill.
C. S. KRICK, New York, N. Y.
J. T. CRABBS, Brooklyn, N. Y.

R. E. DANFORTH, *Chairman*
Newark, N. J.

AMERICAN ELECTRIC RAILWAY TRANSPORTATION AND TRAFFIC ASSOCIATION
29 West 39th Street, New York, N. Y.
Committee on Training of Transportation Employees

Data Sheet No. 86. March 1, 1912.

Company.....

City..... State.....

ORGANIZATION OF TRANSPORTATION DEPARTMENT

1. Please furnish a chart showing organization of Transportation Department, giving briefly the duties of each class of employee.....

SELECTION OF TRAINMEN

1. What are the requisite qualifications for employment as trainmen?.....
.....
.....
2. Have you any difficulty in securing a sufficient number of men with these qualifications?.....
3. If so, why?.....
.....

INSTRUCTION OF TRAINMEN

1. What instruction is given in the School Room?.....
.....
.....
2. What instruction is given on the School Car?.....
.....
.....
3. If neither of the above are used, give brief description of your method of instruction.....
.....
.....
4. What instruction is given in actual operation on car?.....
.....
.....
(a) Minimum number of hours allowed for instruction in School Room....
(b) Minimum number of hours allowed for instruction in School Car.....
(c) Minimum number of hours allowed for instruction in Actual Operation.
.....
5. Is platform instruction entirely under supervision of one instructor or several instructors?.....

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6. Is examination of trainmen after breaking-in period written or oral?.....
.....
How conducted?.....
.....
.....
7. Who finally passes upon a trainman's qualification before he is assigned to work?.....
.....
8. Are trainmen broken in on one line only, or on all the lines of an entire division? .....
.....
9. Do you have a probationary period during which time a man works for himself and before the completion of which he is permanently appointed?....
.....
.....
10. Do you have a probationary period, that is, a period following breaking-in period, where the man is under supervision and at the end of which time an examination is given to determine his fitness for the work?.....
.....
11. If so, describe fully.....
.....
.....

SUPERVISION OF TRAINMEN

1. What method of supervision is employed to see that an employee properly performs his duties?
(a) During probation period?.....
.....
(b) After permanent employment?.....
.....
2. What methods are employed on the line by Supervisors to correct violations?
.....
.....
3. Are violations called to the attention of the trainmen while on duty, in the presence of passengers, or when off duty?.....
.....
4. Are such violations reported to Superintendent?.....
5. What measures, if any, are taken to continue the instruction of qualified men who continue to violate instructions?.....
.....
.....

HANDLING OF TRAINMEN

DISCIPLINE

1. Do you discipline by suspension?.....
2. Do you discipline by placing on extra list?.....
3. Do you use the so-called Merit and Demerit System?.....
4. If Merit and Demerit System is followed, please give details of System (with printed matter, if any), when instituted, and your opinion as to value of results obtained; also a statement of the attitude of the employes toward the system.....
.....
.....
.....
.....

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5. If any of the above plans are not followed exclusively, please describe your methods .....
.....
.....
.....
.....
6. What official or officials are held responsible for the application of discipline?
.....
7. Have you a schedule of penalties for stated infraction of rules?.....
8. In cases of discharge, who finally passes upon same?.....
.....
9. Are men ever re-employed more than one time; if so, what limit is placed upon the number of times?.....
.....

BONUS SYSTEM

1. Has your Company now in effect, or has it had any experience with Bonus Systems of any kind?.....
2. If so, please give the details, the date instituted and the results.....
.....
.....
.....
3. Also state whether your Company provides free uniforms or engages in other practices which would be in the nature of donations.....
.....
.....
4. If you have in vogue any welfare, sick benefit, insurance or pension system, please describe.....
.....
.....
.....
.....

RECORDS

1. Submit samples of blanks used in the selection, appintment, assignment and instruction of new men.....
.....
2. Also, please furnish such additional blanks as are used in maintaining permanent records of employees with a brief description of how they are used, together with any other information you may have on this subject?
.....

LAWS AND REGULATIONS AFFECTING TRAINMEN

1. Submit copies of city or state laws or regulations which have to do with the employment or service of trainmen.....

STATISTICS OF LENGTH OF SERVICE

1. Average number of employees for fiscal year.....
   (a) Regular motormen.....
   (b) Extra motormen.....
   (c) Regular conductors.....
   (d) Extra conductors.....
2. Number of conductors and motormen hired first six months of fiscal year....
3. Of these men, how many were in the employ of the company at the end of the first six months of the fiscal year?.....

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4. How many failed to report for instructions?.....
5. How many failed to qualify after instruction?.....
6. How many failed to report for work after qualifying?.....
7. How many resigned or left during instruction period?.....
8. How many were dismissed during instruction period?.....
9. How many were actually assigned to duty after qualifying?.....
10. How many resigned or left during probationary period, if you have such a period? .....
11. How many were discharged during such probationary period?.....
    Causes .....
    .....
12. How many were accepted as bona fide employees after probationary period? .....
13. How many resigned after acceptance as bona fide employees and before end of fiscal year?.....
14. How many were discharged after such acceptance and before the end of fiscal year?.....
15. Total number of trainmen hired during calendar year.....
16. Total number of discharges and resignations among trainmen, both old and new, during calendar year.....
    General causes.....
    .....
    .....
    .....
17. Average years of service of all trainmen, excluding first year men.....
    (a) If possible analyze by number of men by years from one to five with one total for all men over five years' service (that is, number of two-year men, number of four-year men, etc.)
    .....
    .....
    .....
18. Average weekly hours of work of extra men.....

SUPERVISORY FORCE

1. How selected?.....
    .....
2. What are the necessary qualifications?.....
    .....
    .....
3. What training is given each branch of the supervisory force?.....
    .....
    .....
4. After appointment in the supervisory ranks, what steps do you take to follow up their work and continue their training?.....
    .....
    .....
5. Please send samples of forms, books of instruction, etc., used by your supervisory force, or in instructing them.

Signed.....
Title.....

Notice.—This information blank is sent you in duplicate form. Please fill in the information asked for at your earliest convenience and return one copy to AMERICAN ELECTRIC RAILWAY ASSOCIATION, 29 West 39th Street, New York, N. Y.

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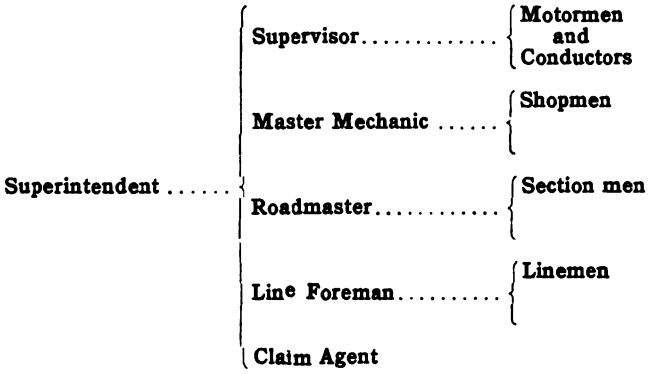
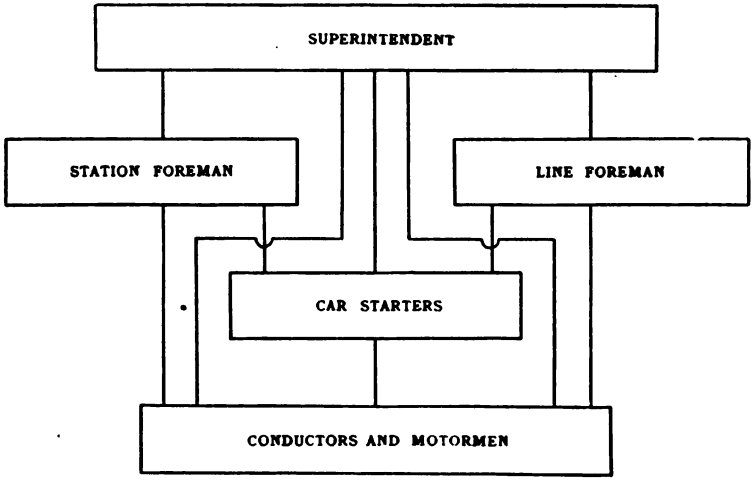
APPENDIX B

TYPICAL ORGINIZATION CHARTS

GROUP A — OPERATING 50 OR LESS CARS.



GROUP B — OPERATING 50–100 CARS.



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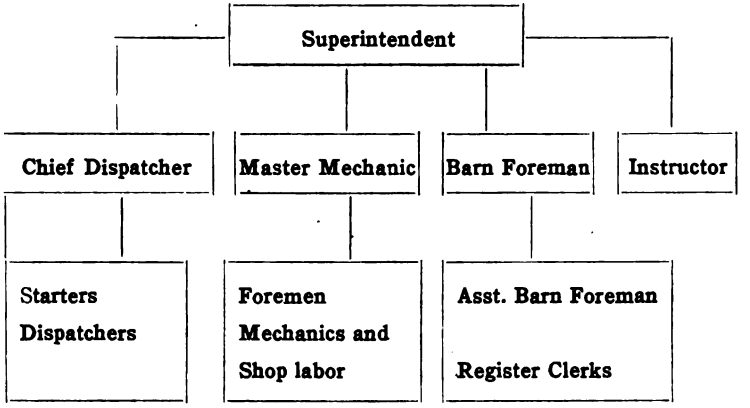
GROUP C — OPERATING 100–250 CARS.



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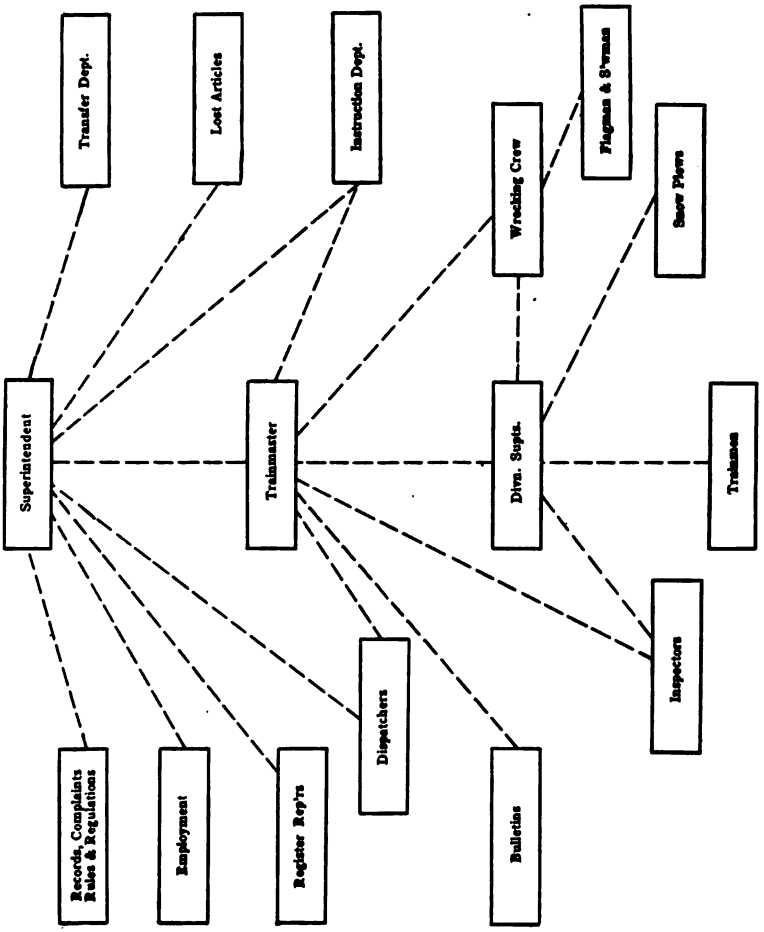
GROUP D — OPERATING 250–500 CARS.



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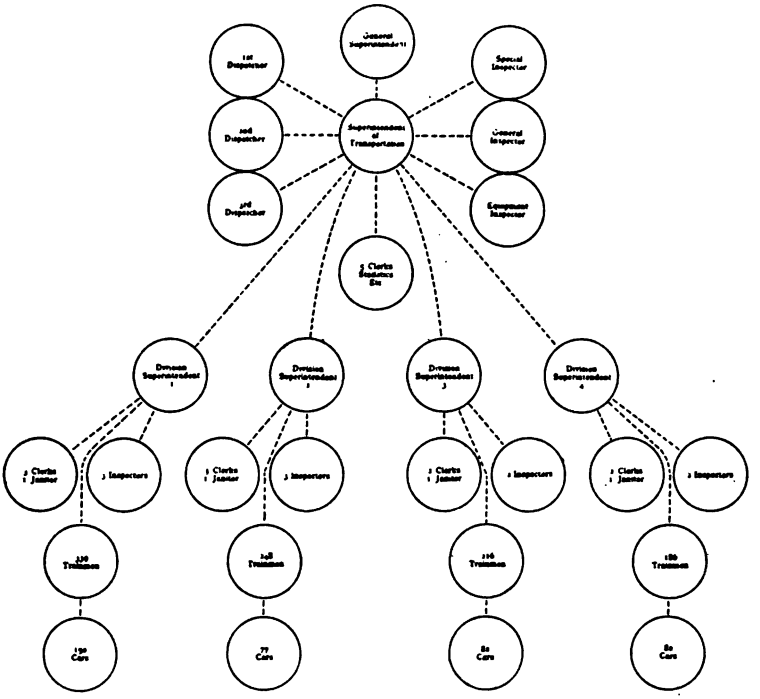
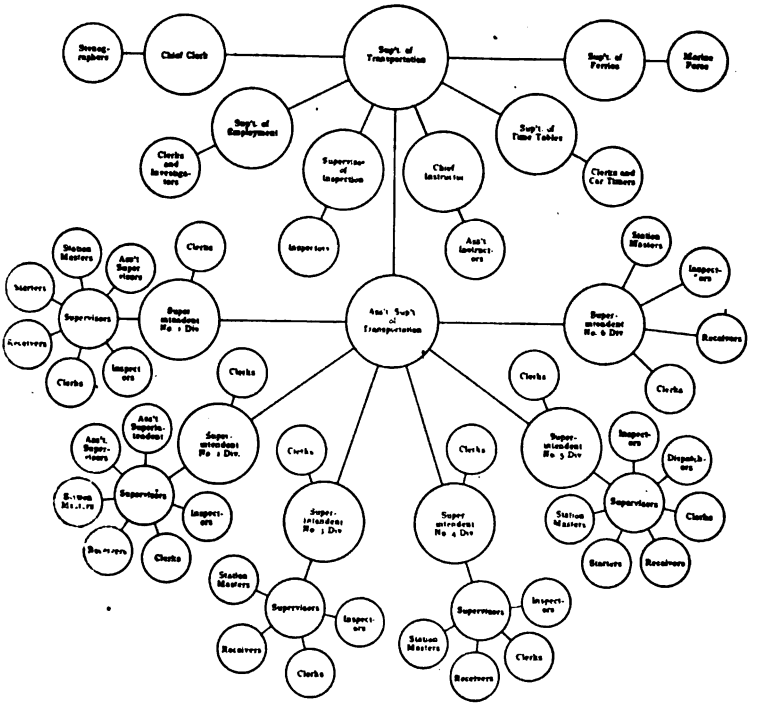
GROUP E — OPERATING 500–1000 CARS.



GROUP F — OPERATING OVER 1000 CARS.



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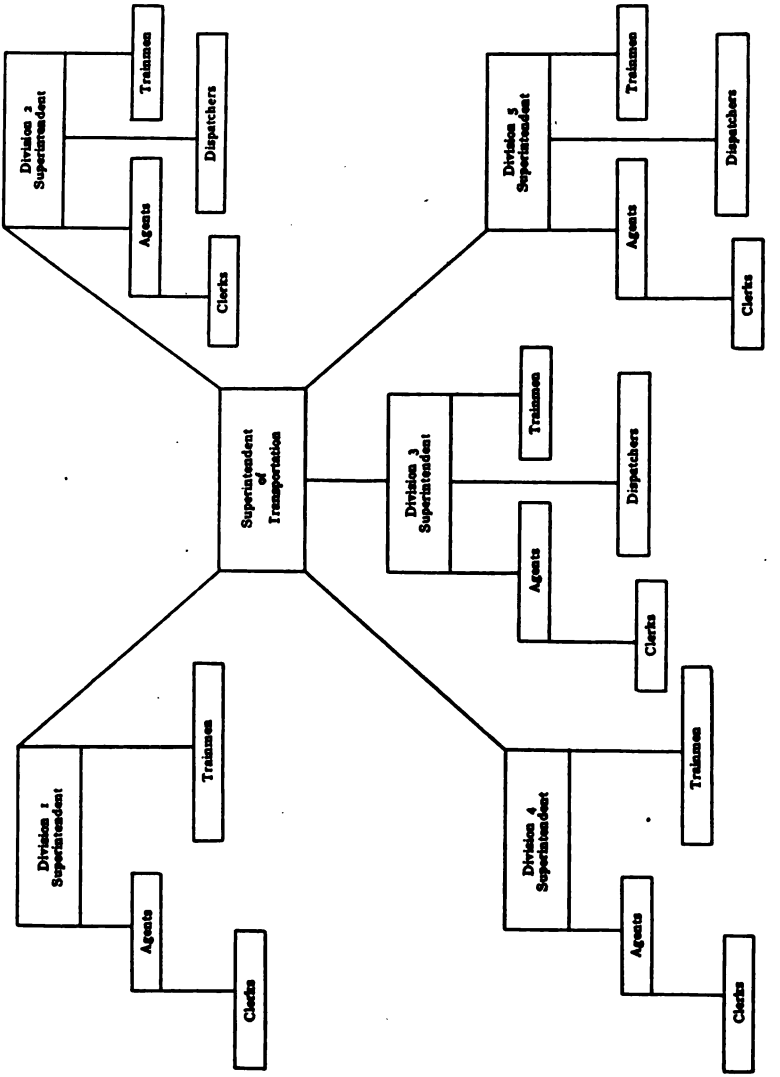
GROUP G—INTERURBAN.



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APPENDIX C

INSTRUCTION OF TRAINMEN

INSTRUCTION BY SCHOOL ROOM, SCHOOL CAR AND ACTUAL OPERATION

Group	City lines A	B	C	D	E	F	Total for city	Inter-urban lines — one class
Minimum number of hours allowed for school room:								
Number of companies having school room	2	3	7	1	5	3	21	7
Number of companies having no limit	1	2	2	0	1	1	6	3
Number of companies having minimum period	1	1	5	1	4	2	14	4
Average length in hours	2	40	6.3	5	17.5	9.5	11.97	5.75
Minimum number of hours allowed for school car:								
Number of companies having school car	1	2	8	2	3	5	21	11
Number of companies having no limit	1	2	2	0	1	2	8	5
Number of companies having minimum period	0	0	6	2	2	3	13	6
Average length in hours	0	0	9.66	79	5.5	9.66	19.70	81.3
Minimum number of hours allowed for instruction in actual operation:								
Number of companies reporting	15	11	16	3	10	6	61	39
Number of companies having no minimum	13	6	6	0	0	2	27	10
Average length of minimum instruction period in hours	185	94	111	102	102	84	106.2	127.8

METHODS EMPLOYED BY SUPERVISORS TO CORRECT VIOLATIONS

	Group A	B	C	D	E	F	Total city lines	Inter-urban lines	Grand total	Per cent of total
Number companies replying	12	7	16	4	11	6	56	29	85	
Number companies correcting violations by superintendent's force cautioning or reprimand	6	2	9	2	6	4	29	14	43	44.35
Number companies giving further instruction	1	0	3	0	2	0	6	2	8	8.25
Companies making oral or written reports and sent to higher officials	3	4	4	1	6	2	20	6	26	26.80
Number companies suspending men	2	1	0	1	0	1	5	1	6	6.18
Called to office	2	0	1	1	1	2	7	4	11	11.33
Miscellaneous	0	0	0	0	0	0	0	3	3	3.09
Number of methods used	14	7	17	5	15	9	67	30	97	

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Practice as to Supervision by One or Several Instructors

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number of companies replying	17	11	16	4	11	6	65	41	106	.....
Number having one instructor	6	3	4	2	2	0	17	7	24	22.62
Number having several instructors	11	8	12	2	9	6	48	34	82	77.38

Practice as to Examination After Breaking-in Period

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number of companies replying	18	12	17	5	11	6	69	42	111	.....
Oral examination	15	9	13	3	5	2	47	26	73	65.8
Written examination	0	1	4	1	3	0	9	9	18	16.2
Both oral and written examinations	1	2	0	1	*3	†4	11	6	17	15.3
No examination	2	0	0	0	0	0	2	0	2	1.8
Mechanical examination	0	0	0	0	0	0	0	1	1	.9

* In one case the motorman has only a written examination while that of the conductor is oral.

† In one case conductor has written examination only, in another has both kinds, while the motorman in each case has only an oral examination to pass.

Practice as to Instruction on One Line or by Divisions Before Eligible for Work

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	18	12	16	4	11	6	67	43	110	.....
Number breaking in on one line	2	0	1	0	0	0	3	4	7	6.36
Number breaking in on all lines	16	12	15	4	11	6	64	39	103	93.64

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PRACTICE COVERING PROBATIONARY PERIODS, I. E., A PERIOD FOLLOWING BREAKING-IN PERIOD, WHEN THE MAN IS UNDER SUPERVISION AND AT THE END OF WHICH TIME AN EXAMINATION IS GIVEN TO DETERMINE HIS FITNESS FOR THE WORK.

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying.....	15	10	14	3	11	6	59	35	94	.....
Number not having probationary period.....	8	9	11	3	9	4	44	25	69	73.4
Number having probationary period.....	7	1	3	0	2	2	15	10	25	26.6
Length of period (days).....	*42	0	*30	0	*30	75	50	0	50	.....

* One company.

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APPENDIX D

SUPERVISION OF TRAINMEN

METHODS OF SUPERVISION EMPLOYED DURING THE PROBATIONARY PERIOD

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	15	7	9	2	9	5	47	33	80	.....
Number companies having such supervision under —										
Instruction department	3	1	4	2	2	2	14	5	19	23.75
Transportation department	9	5	5	0	5	1	25	25	50	62.50
Both instruction and transportation departments	1	1	0	0	2	2	6	1	7	8.70
Miscellaneous	2	0	0	0	0	0	2	2	4	5.00

SUPERVISION AFTER PERMANENT EMPLOYMENT

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	17	11	16	4	11	6	65	36	101	.....
Looked after by —										
Inspectors and road officers	9	11	13	4	11	6	54	17	71	70.4
Superintendent transportation, trainmaster, etc	1	0	1	0	0	0	2	12	14	13.8
General superintendent	7	0	2	0	0	0	9	7	16	15.8

PRACTICE COVERING THE MATTER OF BRINGING VIOLATIONS TO THE ATTENTION OF TRAINMEN

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	17	11	16	4	11	6	65	42	107	.....
Number companies cautioning —										
(a) On duty	2	3	11	2	7	4	29	9	38	35.5
(b) Off duty	14	7	5	2	3	2	33	31	64	59.8
(c) Both	1	1	0	0	1	0	3	2	5	4.7

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PRACTICE COVERING THE REPORTING OF VIOLATIONS

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	18	11	16	4	11	6	66	39	105	.....
Number reporting to superintendent	17	8	13	4	10	5	57	38	95	90.47
Number reporting to others	1	0	0	0	1	0	2	1	3	2.86
Number not reporting mistakes or offenses to superintendent or others	0	3	3	0	0	1	7	0	7	6.67

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APPENDIX E

HANDLING OF TRAINMEN

DISCIPLINE BY SUSPENSION

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	17	12	16	4	11	6	66	42	108	.....
Number companies replying yes	11	10	11	1	7	4	44	33	77	71.4
Number companies replying no	3	2	4	3	4	1	17	5	22	20.4
Number companies replying, in some cases	3	0	1	0	0	1	5	4	9	8.2

DISCIPLINE BY RETIREMENT TO EXTRA LIST

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	17	11	16	4	11	6	65	43	108	.....
Replying yes	7	8	10	1	7	3	36	15	51	47.20
Replying no	6	2	5	2	2	0	17	26	43	39.82
Replying yes only for missing	1	0	1	0	2	2	6	0	6	5.56
Replying not regularly	3	1	0	1	0	1	6	2	8	7.42

THE USE OF SO-CALLED MERIT AND DEMERIT SYSTEMS.

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Companies replying	18	11	16	4	11	6	66	43	109	.....
Replying yes	2	0	3	0	1	2	8	7	15	13.76
Replying no	15	11	12	4	10	4	56	36	92	84.40
Have under consideration	1	0	0	0	0	0	1	0	1	0.92
Demerit system only	0	0	1	0	0	0	1	0	1	0.92

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Practice Covering Schedules of Penalties for Stated Infraction of Rules

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	18	12	15	4	11	6	66	43	109	.....
Number companies replying yes	2	4	2	0	2	2	12	6	18	16.50
Number companies replying no	14	8	13	4	9	2	50	29	79	72.50
For some infractions	2	0	0	0	0	2	4	8	12	11.00

Re-employment

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies reporting	17	12	23	4	11	6	73	41	114	.....
Companies who do not re-employ	5	2	0	0	0	0	7	15	22	19.30
No, if discharged; otherwise, yes	0	0	0	0	1	1	2	5	7	6.14
If previous record O. K	6	7	7	2	5	3	30	16	46	40.35
Companies who do re-employ	6	3	16	2	5	2	34	5	39	34.21
Companies re-employ twice	2	2	1	1	1	0	7	5	12	.....
Companies re-employ 3 times	0	0	2	0	2	2	6	0	6	.....
Companies re-employ, no limit	2	3	6	1	1	1	14	10	24	.....
Companies re-employ, do not say	8	5	14	2	7	3	39	11	50	.....

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APPENDIX F

BONUS SYSTEMS

As to Whether in Effect or Not

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	16	12	14	4	9	6	61	40	101	.....
Replying yes	1	0	4	1	4	3	11	4	15	14.86
Replying no	15	11	10	3	5	3	49	36	85	84.15
Did have but have abandoned	0	1	0	0	0	0	1	0	1	0.99
Have under consideration	0	0	0	0	0	0	0	0	0	.....

Free Uniform or Other Similar Practices

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	16	11	16	4	10	6	63	41	104	.....
Replying yes	4	1	5	0	2	0	12	1	13	12.50
Replying no	12	10	11	4	8	6	51	40	91	87.50
Christmas turkey	1	1	1	0	0	0	3	1	4	3.85
Free uniforms, complete	2	0	4	0	2	0	8	0	8	7.69
Free caps	1	0	0	0	0	0	1	0	1	0.96

Welfare Plans in Effect

	Group						Total city lines	Inter-urban lines	Grand total	Per cent of total
	A	B	C	D	E	F				
Number companies replying	14	11	15	4	10	6	60	40	100	....
Number reporting yes	7	8	11	2	6	4	38	18	56	56
Divided as follows:										
Benefit association	3	7	7	2	6	4	29	16	45	45
Insurance system	0	0	1	0	0	1	2	1	3	3
Pension system	2	2	3	0	2	3	12	3	15	15
Hospital fund	1	1	1	0	0	0	3	1	4	4
Company doctor, free service	1	0	1	0	0	0	2	0	2	2
Club rooms	0	0	2	0	0	0	2	1	3	3
Special cash donations to needy employees	0	0	1	0	0	1	2	0	2	2

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APPENDIX G.
Statistics of Service of Trainmen.
Instruction Period

Group	Class	Number companies	Average number of employees for fiscal year	Motormen		Conductors		Conductors and motormen hired first six months	Number dropped as incompetent	Number of men resigning	Number of men discharged
				Regular	Extra	Regular	Extra				
A	1–50	9	430	174	54	156	46	182	6	63	5
B	50–100	8	1,247	466	142	463	176	399	8	59	8
C	100–250	9	4,178	1,544	478	1,530	626	1,861	51	410	53
D	250–500	*0	.....	.....	.....	.....	.....	.....	.....	.....	.....
E	500–1,000	6	7,022	2,716	704	2,702	900	2,854	59	505	81
F	over 1,000	4	17,421	6,602	1,989	6,649	2,181	5,887	378	779	109
Total city lines.	.....	36	30,298	11,502	3,367	11,500	3,929	11,183	502	1,816	256
G, interurban lines..	All cars...	19	3,110	1,153	342	1,197	418	679	33	47	23

* No information available.

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STATISTICS OF SERVICE OF TRAINMEN — Continued

Group	Number actually assigned to duty	Number resigned during probation period, if any	Number discharged during probation period, if any	Number accepted as bona fide employees after probation period	Number left at end of first six months	After acceptance as bona fide employees		Total number of trainmen hired during year	Total number of trainmen discharged and resigned during year
						Resignations up to end of fiscal year	Discharges up to end of fiscal year		
A	108	0	12	96	57	16	6	282	229
B	324	1	1	322	177	60	92	647	462
C	1,347	0	0	1,347	905	†	†	3,511	2,940
D*	.....	.....	.....	.....	.....	†	†	.....	.....
E	2,209	226	64	1,919	1,086	†	†	4,808	4,184
F	4,621	396	217	4,008	2,928	†	†	11,576	10,517
Total city lines	8,609	623	294	7,692	5,153	.....	.....	20,624	18,332
G, interurban lines	566	0	1	565	443	96	75	1,240	721

* No information available. † Not complete.

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INSTRUCTION AND PROBATION PERIOD, &C., FIRST SIX MONTHS.

GROUP	Number of conductors and motormen hired first six months	Number left at end of six months	Number dropped as incompetent	Number of men resigning	Number of men discharged	Per cent of men resigning to number hired	Per cent of men dropped as incompetent to total hired	Total number leaving, all kinds	Per cent of total discharged to total leaving	Total hired for fiscal year	Total resigning and discharged for year	Per cent of resignations and discharges to total hired for year
A	182	57	6	63	17	34.60	3.19	86	19.76	282	229	81.2
B	399	177	8	60	9	15.00	2.00	77	11.70	647	462	71.5
C	1,861	905	51	410	53	22.00	2.74	514	10.31	3,511	2,940	83.7
D	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
E	2,854	1,086	59	731	145	25.62	2.07	935	15.50	4,808	4,184	86.8
F	5,887	2,928	378	1,175	326	20.00	6.42	1,879	17.37	11,576	10,517	91.2
Total, city	11,183	5,153	502	2,442	550	21,86	4.50	.....	15.72	20,624	18,332	88.8
G, interurban	679	443	33	47	24	6.92	6.92	104	23.07	1,240	721	58.2

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TERMS OF SERVICE AND PERCENTAGES TO TOTAL TRAINMEN (EXCLUDING FIRST YEAR MEN).

GROUP	Total number of men, exclusive of first year men	Number of —					Percentage of Total — Exclusive of First-year Men				
		Second-year men	Third-year men	Fourth-year men	Fifth-year men	Men over five years	Second-year men	Third-year men	Fourth-year men	Fifth-year men	Men over five years
A	314	57	36	33	35	153	18.18	11.48	10.51	11.15	48.70
B	835	193	197	69	171	205	23.15	23.60	8.27	20.50	24.60
C	2,784	681	436	335	255	1,077	24.45	15.65	12.05	9.15	42.25
D	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
E	4,433	891	655	405	*1,601	881	20.18	14.82	9.15	*36.20	19.95
F	12,963	1,803	1,144	1,133	1,212	7,671	13.94	8.84	8.76	9.36	59.40
Total city	21,329	3,625	2,468	1,975	3,274	9,987	17.05	11.58	9.26	15.36	46.80
G, interurban	2,249	474	425	264	278	808	21.08	18.90	11.72	12.38	35.92

*Three companies, included men over five years in five-year figure.

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RELATION OF TOTAL HIRED (1 YEAR) TO TOTAL IN SERVICE

GROUP	Number of companies	Average number of employees for the fiscal year.	Conductors and motormen hired during year	Per cent of new men hired to total	Number of employees in service more than one year	Per cent of new men to older men
A — 1–50.....	9	430	282	65.6	314	89.9
B — 50–100.....	8	1,247	647	51.8	835	77.4
C — 100–250....	9	4,178	3,511	84.0	2,784	125.8
D — 250–500.....	0	.....	.....	.....	.....	.....
E — 500–1000....	6	7,022	4,808	68.5	4,433	108.6
F — over 1000...	4	17,421	11,576	66.4	12,963	89.2
Total city lines	36	30,298	20,624	68.2	21,329	96.8
G, Interurban....	19	3,110	1,240	39.9	2,249	55.2

TERMS OF SERVICE INCLUDING FIRST YEAR MEN

GROUP	Total number of employees excluding first year men	First year	Second year	Third year	Fourth year	Fifth year	Over five years
A.....	314	116	57	36	33	35	153
B.....	835	412	193	197	69	171	205
C.....	2,784	1,294	681	436	335	255	1,077
D*.....	.....	.....	.....	.....	.....	.....	.....
E.....	4,433	2,589	891	655	405	†1,601	881
F.....	12,963	4,477	1,803	1,144	1,133	1,212	7,671
Total city lines	21,329	8,888	3,625	2,468	1,975	3,274	9,987
G.....	2,249	597	474	425	264	278	808

* No information complete. † Three companies include men 5 years and over in one figure.

CHAIRMAN BRUSH:— If it is agreeable to the members it would seem wise to have the report of the Committee from the Claim Agents' Association read, and then discuss the two reports at the same time. Mr. H. K. Bennett, President of the Claim Agents' Association, has kindly consented to read the report in the absence of the members of the Committee.

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REPORT OF THE COMMITTEE OF CLAIM AGENTS' ASSOCIATION ACTING WITH COMMITTEE ON TRAINING OF TRANSPORTATION EMPLOYEES

To the American Electric Railway Transportation and Traffic and the American Railway Claim Agents' Associations:

GENTLEMEN.— The action of the Transportation and Traffic Association's Committee on the training of transportation employees in requesting the Claim Agents' Association to appoint a Committee to co-operate with them in this important work, is another indication of the growing tendency toward co-operation that has manifested itself in recent years. The hard drawn lines of demarkation between departments are gradually disappearing, and suggestions and advice are now being sought by departmental heads that if volunteered in the past would have been not only rejected but resented.

The work of the Claim Department dovetails in so closely with that of the Operating Department, and the question of getting results by the former depends so largely upon the manner in which the men, particularly the platform men, are trained, that it becomes absolutely essential to draw on the Claim Department for assistance in carrying on the work. Being constantly in touch with the accident question, the Claim men naturally become experts in their peculiar line of work, and are, therefore, able to direct or outline the best methods of training the employees with regard to the prevention and proper handling of accidents.

Now that the Operating men are giving us an opportunity to be heard in this matter which concerns us so vitally, we must use great care not to go beyond the confines of our own province, accident work. The Claim Agent who meddles with strictly operating matters will quickly undo, so far as his own company is concerned at least, all the good that has been accomplished.

To get at the bottom of this matter and demonstrate how much experience and training count, we have worked out a graphic chart, based on data obtained from the records of the Public Service Railway Company of New Jersey for the purpose of showing accident records of men in the service for different periods of time. These figures are not exactly true, but they are close enough for all practical purposes. To begin with, we had to ascertain what the periods of service were for the whole force, and to arrive at this it was necessary to take the records as of a certain day, while the accident records upon which the table is based were for the entire year of 1911. When we say the figures are not exactly true, we refer only to the method of arriving at the makeup of the force, which, of course, varies slightly throughout the year, but you can see that it would be almost

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an impossible task to get the true average for the entire year. Otherwise the conclusions are based on actual figures. This chart is attached hereto. One curve shows the percentage of men in the service for different periods of time, from one to forty years, to the whole number, and the other curve shows the percentage of the whole number of accidents attributable to men of the different periods of service. In the first chart we got out, we also indicated the cost, but it proved to be so consistent with the number of accidents that we omitted it in the chart herewith submitted.

Some of the deductions are startling, and as the Claim expenditures of the Public Service Railway Company are, at least, as low as the average for the larger companies, being less than 4.50 per cent of the gross receipts, it is reasonable to suppose that the conditions upon which the figures were based do not differ materially among the various companies.

To begin with, we found 34.50 per cent of the men had been in the service less than one year, and tha tthere were attributable to these men 61 per cent of all accidents for the year; 65.50 per cent of the force had been in the service over one year, and there were attributable to them 39 per cent of all the accidents. Based on the Public Service Railway Company's expenditures for accident settlements, exclusive of the cost of maintaining the Claim Department, we find that the first year men were costing the Company at the rate of $202.98 per man for the year, and that the men over one year in the service were costing $66.82 per man for the year, or just about one-third as much. It is not unreasonable to suppose that the lack of training and experience of the first year men cause proportionate waste in the Operating and Mechanical Departments.

Below is the average accident cost per man for the year 1911, based on the Public Service Railway Company figures, for different periods of service from one to four years:

1st year men averaged	$202 98
2nd year men averaged	135 57
3rd year men averaged	83 23
4th year men averaged	47 35

Of course, these figures indicate the value of maintaining so far as possible a permanent force more clearly than they do the advantage of training, but we hold that a permanent force naturally becomes a well trained force, if it is only from the experience gained, for, as the old adage says truly "Experience is the best teacher."

Circular letters were sent out by your Committee to the Claim Agents of all member companies, asking what steps were being taken by their companies in the matter of training of transportation employees with relation to the accident question. Fifty-two replies were received, of which fifteen were from Interurban roads and thirty-seven were

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from roads operating in cities. The information contained in these replies is tabulated below, the figures under each heading showing the number of companies pursuing that method. Thus, in the table for City roads it is shown that eighteen companies have "No part taken by Claim Department," while five companies have "New men report to Claim Department for instructions," and also have "Periodical talks by Claim Department representatives." Thus the footing on the various headings naturally exceeds the total number of replies, as several companies use two or more methods.

	New men report to Claim Department for instructions	Periodical talks by Claim Department representatives	General Meetings of Employees, Claim Department topics discussed	Bulletins, Journals and Circulars issued in regard to Accidents	Safety Leagues for Employees	General Schools of Instruction	Claim Department Schools of Instruction	No part taken by Claim Department	Total number of Companies replying
INTERURBAN	.....	.....	.....	.....	.....	.....	.....	2	2
	.....	2	.....	.....	.....	.....	.....	.....	2
	2	.....	.....	.....	.....	.....	.....	.....	2
	1	.....	.....	.....	1	.....	.....	.....	1
	.....	.....	1	.....	.....	.....	.....	.....	1
	1	.....	1	.....	.....	.....	.....	.....	1
	1	.....	1	1	.....	.....	.....	.....	1
	.....	1	.....	.....	.....	.....	.....	.....	1
	.....	1	.....	.....	.....	.....	1	.....	1
	.....	1	.....	.....	.....	.....	.....	1	1
	1	1	.....	1	.....	.....	.....	.....	1
	.....	.....	.....	.....	1	.....	.....	.....	1
	6	6	3	2	2	1	1	2	15
CITY ROADS	.....	.....	.....	.....	.....	.....	.....	18	18
	5	5	.....	.....	.....	.....	.....	.....	5
	.....	.....	1	.....	.....	.....	.....	.....	1
	.....	1	.....	1	.....	.....	.....	.....	1
	.....	1	.....	.....	.....	1	.....	.....	1
	.....	.....	.....	.....	.....	3	.....	.....	3
	.....	.....	.....	.....	.....	1	1	.....	1
	2	.....	.....	.....	.....	.....	.....	.....	2
	.....	.....	.....	.....	.....	.....	1	.....	1
	.....	.....	.....	.....	1	.....	.....	.....	1
	.....	1	.....	.....	.....	1	.....	.....	1
	.....	1	.....	.....	.....	.....	.....	.....	1
	.....	1	.....	.....	.....	1	1	.....	1
	7	10	1	1	1	7	3	18	37

The failure of a large percentage of the companies to reply probably indicates that their representatives have done little or nothing in the matter. The replies we did receive show a wide divergence in methods employed. It would seem, therefore, that there is much to be accom-

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plished through these joint sessions. It is to be hoped that the work will finally result in uniform methods being adopted applicable to properties of various sizes, in which the work of standardization will be carried out even to the wording of the various forms of instructions.

H. V. DROWN, *Chairman,*
P. C. NICKEL,
R. E. MCDOUGALL,
Committee on Training of Employees.

Discussion of Reports on Training of Transportation Employees

(President Shannahan in the chair.)

PRESIDENT SHANNAHAN:—The business now before the house is the conclusions of the Committee. What is your pleasure, gentlemen?

It has been suggested that they be taken up one at a time and acted upon definitely. The first refers to the matter of the selection of employees. (See page 339.) The question is on whether you agree with the conclusions of the Committee. The Chair will entertain a motion.

(On motion seconded, the first recommendation was approved.)

PRESIDENT SHANNAHAN:—The second conclusion is on the matter of instruction. (See page 339.) Do you agree with the Committee?

MR. BRUSH:— It would be impossible on a large property to follow the recommendation contained in the second sentence: "It is best secured by a student receiving fundamental instruction from one instructor only." He can be subject to the direction of one instructor only, but it might not be entirely feasible to have one man receive all his fundamental instruction from one particular man. It might even be wiser to have experts in various lines instruct these men. If it was changed to read: "Receive fundamental instruction under the direction of one instructor only," it would give the chief instructor an opportunity to use his experts.

MR. CAMERON:—What the Committee had in mind was that the motorman, for instance, be broken in for the first two or

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three days under one motorman and not be changed around between two or three motormen — receive his instruction from one motorman only. This does not mean the chief instructor, it means the motorman or the conductor in service.

MR. BRUSH:— Is the word "instruction" just the right word then? I assume that in instructing the men a great percentage of the properties to-day have a regular school of instruction in which the men are properly instructed previous to their being assigned to a man on the car which is what I had in mind. If what you say is the meaning of the Committee, it is satisfactory, but my thought is that perhaps the recommendation may not be clear to some who do not hear this discussion.

(On motion, duly seconded, the recommendation was approved.)

PRESIDENT SHANNAHAN:—The third recommendation refers to the matter of Supervision. (See page 339.) Do you approve of this recommendation of the Committee? Those in favor of approving it will say "Aye"; contrary, "No." (Motion carried.)

The fourth is on Discipline. (See page 340.) What is your pleasure on this question? Those in favor of approving the recommendation will say "Aye"; contrary minded, "No." (Motion carried.)

MR. BRADLEY:—May I ask, what is the purpose of approving these reports? Are they to be prepared and sent out to the various companies, or what is to be done with them after they are approved?

SECRETARY DONECKER:— It is just a question whether or not you agree with the conclusions of this Committee. For instance, this one strikes me as quite an important recommendation. It is recommended that suspension shall be avoided wherever possible, and the records shown in this report and in the report of the Committee on Construction of Schedules and Time-Tables show a pretty wide variation in the practice of companies on this particular matter. It strikes me that the conclusion of the Committee is certainly worthy of some discussion by the members here.

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MR. BRADLEY:— If I understand that this report after it has been approved or disapproved, is to be prepared in circular form and sent out to the companies, bearing the approval of this Association, I want to take exception to some of these things.

PRESIDENT SHANNAHAN:—That is the very purpose, Mr. Bradley.

MR. BRADLEY:—Then I will say this: For instance, on the question of discipline and suspension, I am unalterably opposed to any form of suspension for any man in train service, for any cause whatsoever. I think it is a step in the wrong direction. It is punishment that is meted out for a class of men that is not meted out to any other class of men. As a rule you do not suspend a shop man or a track man, so why should we arbitrarily give such punishment to trainmen? There are better ways of determining a proper man and satisfactory employee than by subjecting him to that loss of time and creating for many reasons a much more undesirable employee.

MR. BURLEIGH:— I heartily concur in that sentiment. Our experience in Public Service goes to show such a man is a very great detriment to the service during the period of suspension. You lose the activity of the man and you are obliged to fill his place with, perhaps, a less experienced man. Our records all show that inexperienced men are principally responsible for our accidents. In Mr. Drown's chart, in one of these papers, it is clearly demonstrated that the bulk of our accidents are caused by our first year men, and the greater proportion of those are caused by the first and second month men. When a man has been in the service for a year, practically without accident, in suspending him for infractions of the rules you make more or less an enemy of him instead of holding a friend. In our report on welfare to the main body of the Association, we strongly condemned the system of suspension. There are a good many rules that automatically cause the suspension of men involved in certain kinds of accidents and this, in my judgment, is a mistake. I wouldn't any more think of dismissing an old employee without the action being made a matter of consideration by those higher up, than I

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would of charging off a car. Both are assets. They ought not to be disposed of without serious consideration.

SECRETARY DONECKER:—Mr. Burleigh, might we ask you to say something with regard to Mr. Drown's report, particularly the charts showing the number of accidents chargeable to the new man. I think it is related to the subject now being discussed and is somewhat in line with what you have just said. I don't think the members fully understand just what these charts cover.

MR. BURLEIGH:—Mr. President, the experience of Public Service for the year of 1911 was something like this: We have a regular force of about thirty-seven hundred platform men. We actually passed upon ten thousand applications for employment. We actually employed forty-five hundred during the year. Bear in mind that our regular force is thirty-seven hundred and that we actually employed in the year 1911 over forty-five hundred. Now there is something wrong when the facts tell such a story. Of course, the relation that register records bear to employments is unavoidable; we cannot escape that. During that time suspensions and dismissals were the usual penalties for infractions of the rules. But our experience has been somewhat better this year. If the same ratio that has obtained for the first eight months prevails throughout the twelve, we will have employed twelve hundred less men. Now if the new men are the troublesome men, the ones who cause the accidents — and the chart which Mr. Drown has prepared shows that such is the case — with nearly twelve hundred less new men to educate we shall have saved ourselves a lot of money. Mr. Drown's chart shows that the new men cost in accidents for the first year, an average of $202 for each man and, as I have said, we will have employed twelve hundred less men in a year. In addition to the saving in the cost of accidents, there is the matter of the expense of training new men and also the matter of annoyance to passengers in having a new man on either end of the car. New men are inefficient in so many ways, so we look upon the elimination of these several factors as a very great saving indeed. We have not gone to the extreme of permitting no suspension; a review of

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each case by the general superintendent before suspension, is provided for. We want to get to a point where the division superintendent will prefer charges instead of ordering suspensions and dismissals. The men will be called to the front, and will be talked to in a frank sort of a way, in the same way that you would talk to your son if he erred. Efforts will be made to show the man that he did wrong and that he cost the company money, and to send him away with an understanding of whatever plan may be adopted of marking demerits against him, together with the knowledge that an accumulation of such marks would mark him as unfit to be continued in the service.

Now as to this chart, gentlemen, it shows that sixty-one per cent of all our accidents were caused by first-year men, and that the aggregate cost of the accidents was almost the same percentage. Sixty-one per cent of all the money spent on accidents was due to the neglect of first-year men. Going down into the lower diagram, it shows that, taken by months, it is the first month men that have most of the accidents. That is due I suppose to insufficient training; although we have schools of training, and do everything that we can to make the men fit. Of course a new man, however well he may be trained, is never really efficient until he has had the actual experience of handling a car for a while. When you get to the six months man, the number of his mishaps have been lessened materially, as you can see by this chart, and when a man has had twelve months' experience he has gotten to a point where he has very few mishaps indeed. Further, when a man has been in the service three years or more our experience shows that he goes along practically without accidents. We have records of men of ten years' service who have had no mishaps in all that time. This chart I regard as most convincing evidence of the value of retaining experienced men and so joining Mr. Bradley I want to concur as fully as I can in advocating the principle of no more suspensions.

MR. BRADLEY:—Mr. Chairman, I move that all that part of the report under Discipline (a), be stricken from the report after the word "avoided." The recommendation would then read "Discipline (a) Suspension. Suspension should be avoided."

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MR. SCHNEIDER:—The remarks we have heard pertain specifically to city service. Our experience in interurban service is somewhat different from the experience of those in city service. I find that in the last three years, we have not suspended anyone of our platform men over five days for any cause. If the offense has been grave enough we have dismissed, and in consequence of that, fifty-five per cent of our men have been with us five years and over, so that we do not hire many new men. I also find that fifty per cent of the accidents occur to men who have been employed over two years, so that we don't have the accidents due to newer men, although the percentage of new men is a great deal less.

MR. ECKER:— I would like to ask whether Public Service calls the men to the General Superintendent's office on their own time or on the company's time?

MR. BURLEIGH:— On their own time.

MR. ECKER:— Then it is automatic suspension — the loss of one day's pay. That in itself is the equivalent of suspension for one day.

(Motion seconded and carried.)

MR. CARSON:— I might state briefly that the only objection I have to Mr. Bradley's view is this, that it might become necessary, absolutely necessary sometimes to suspend a man; I know that such is at times necessary, and I think that the conclusion of the Committee is a good one. I would dislike to operate a street railway company and not have the power of suspending a man sometimes, however. Now take this instance — I know there may be but a few such, but there are some — suppose a trainman became intoxicated at the outside end of the line, would you not have to suspend him when he came in; or perhaps send a man out on the road to relieve him. I say it should not be done, as a rule suspension should be resorted to but rarely, but I say again suspensions are sometimes necessary. Suppose a trainman had a bad accident, he sustained no physical injury but the accident might cause a nervous condition that would make it unsafe for him to operate for several days, and suspension would be absolutely necessary.

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PRESIDENT SHANNAHAN:—The question is on Paragraph (b), (see page 340) "Dismissal": What is your pleasure?

PRESIDENT SHANNAHAN:— It has been moved and seconded that this paragraph be adopted. Is there any discussion? Now, gentlemen, if you want to discuss this, do so now.

MR. W. H. COLLINS:— I am not in favor of this recommendation or conclusion of the Committee with regard to dismissal. I think that the power of dismissal should be retained by the division superintendents. I see this suggests that it be done by a general operating official on the smaller roads, preferably an executive officer. Now I believe that would be taking away from our division superintendents authority that they should have. I think you are practically making a division superintendent useless if you take that authority away from him. If he has the power to employ those men, he should have the power to discharge them.

MR. BRADLEY:—Mr. Chairman, if I understand the recommendation of this Committee it is that dismissals as outlined shall be approved by an executive officer, and does not necessarily require that the executive officer dismiss in person. If that is the purpose of the recommendation, I favor it. If it is not, I agree with the gentleman who has just spoken. Certainly the most important asset of the company is discipline, and the executive officers should approve it. He may approve and execute this recommendation through some one else, a superintendent, division superintendent, and so forth; that is my interpretation of this recommendation.

MR. W. H. COLLINS:— It does not so read, Mr. President.

PRESIDENT SHANNAHAN:—Mr. Cameron, won't you come up here and aid the Chair in this matter? And Mr. Wells, also. What was the intention of the Committee, on that point?

MR. CAMERON:— It means that if you have a road where you have eight or nine division superintendents, each one having power to discharge the men on his own division, one of them would probably discharge a man for something that another one would not discharge him for. It is for the purpose of uniformity that the general manager, or general superin-

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tendent or whoever he may be, should approve these discharges. The division superintendent should recommend the discharges, and state his reasons, and then the president or vice-president or whoever it may be, should finally approve the discharge, and it is not effective until he does approve it.

MR. BRUSH:— I would move to amend recommendation (b) so that it will read "Dismissals should be approved by an official not in daily contact with the men."

(Amendment accepted and motion carried.)

SECRETARY DONECKER:—The next section is (c) "No re-employment." (See page 340.)

(Moved and seconded that the recommendation be stricken from the report.)

MR. W. H. COLLINS:— I think we have men that we have re-employed, who have turned out to be some of the best men we have ever had. I do not think it is fair in all cases. Take this case for instance: We have had men on our road who, when they were young and single, have done foolish things that they would not do after they had the responsibilities of a family. That is one thing. And then again we have had other men that have gone through an accident, possibly a serious accident, and that experience has taught them something, after they have had time to think it over. After they have gone out into the world and tried to get a position, and then have realized what they had before, these men have come back to us, and are some of the best men in our employ.

MR. SCHNEIDER:— I never have re-employed a man that I have discharged who has been of benefit to me.

MR. WALSH:— Being connected with a large company I have always been greatly interested in the matter of suspensions and dismissals. I understand that there are other things with which the operating department is concerned which necessarily sometimes must govern the matter of dismissal, aside from matters in which the claim agent is deeply interested. I heartily concur, however, in what Mr. Burleigh has said with reference to suspensions. In my judgment, if you are going to dismiss a man, I think that should be the final act that is done. I don't believe in dismissing a man simply because he has had an accident. Sometimes some of the oldest and best

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men that we have are unfortunate enough to meet with serious accident, through lapse of attention perhaps, but a good man never makes the same mistake twice, and when you dismiss an experienced man for an accident, you simply have to re-employ somebody in his place who is inexperienced, and who has a thousand and one chances of having an accident, where an older man has none. My opinion is that if the man is discharged it ought to be final. I do not understand why any one should want to discharge a man if the offense is not sufficiently grave to warrant permanently severing his connection with the company. I do not think he should be discharged unless he should be discharged for good. I do not believe that there should not be discipline when the organization is endangered by leaving a man in the service, but when once a man is discharged I think it should be final.

MR. TICHENOR:— I agree with the gentleman who spoke last. Of course this is from the standpoint of the claim agents. I do not believe that any man should ever be discharged for having had an accident. Claim agents are all acquainted with the story of the Garden of Eden, as well as the Golden Rule, and we know that the wisest man in the world made the greatest mistake that was ever made, and we do not believe that any man ought to be discharged because he has made a mistake. All accidents in themselves are simply mistakes. No motorman or conductor ever intends such a thing any more than the man who gets hurt intends it. If a man continually makes mistakes or continually does anything until it becomes known to the management that he is not a qualified man to act, then he might be discharged because of not being an efficient employee but not because he has had an accident. I am opposed to the motion.

MR. SCHNEIDER:— It is a question in my mind whether the psychological conditions that lead up to an accident by a trainman which would warrant his discharge would not occur again with that same man.

MR. BRADLEY:— Mr. Chairman, if the gentleman who made the motion to strike that out will accept an amendment to strike out all that part of the recommendation after the word "resort" I offer the amendment. If not, I move to place the

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motion on the table. The recommendation as amended would read: "Dismissals should only be administered as a last resort."

(Amendment accepted.)

MR. CALLAGHAN:— I notice the claim agents do not want the men returned. I do not want to get sacrilegious in this matter but I know that there are a number of men who after having been discharged and come back make the very best kind of employees, and I want to call their attention to the fact that a sinner can always come back to church.

MR. CAMERON:— I would like to say this, that these conclusions are arrived at after studying very diligently the replies received from a number of companies. Some of these things are not things that we are all agreed upon, or that we think best, but they are the conclusions derived from studying the answers received from the various companies.

MR. BRUSH:— In order to defend the Committee. The recommendation states that employees shall only be dismissed as a last resort, with no hope of re-employment. I don't believe there is any gentleman in the room who at the time of discharging a man would say to him "Now I am going to discharge you, but if you come back at the end of five or six years and be a good boy I will hire you again." I don't see that the changing of the words of the Committee benefits us at all, because as it now reads it covers all the points. There is no one here I believe, who would discharge a man, telling him at the time that he discharges him that he may be able to come back to work again. This conclusion is that at the time he is discharged, he should be discharged with no hope of re-employment. However, if at the end of five years you see fit to hire him again, that is another proposition, but at the time you discharge him you do not hold out any hope of his coming back in your employ again. I think the conclusion should stand as it now is.

SECRETARY DONECKER:—Mr. Bradley moves that recommendation (c) under "Discipline" be changed to read: "Dismissals shall only be administered as a last resort."

(A standing vote resulted 36 in favor; 28 opposed. Motion carried.)

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PRESIDENT SHANNAHAN:— Mr. Bradley's motion carries. The Secretary will read Section (d), "Annual Adjustment of Record." (See page 340.)

(Motion for adoption duly seconded and carried.)

The Secretary then read Section (a) under Welfare. (See page 340.)

(Motion for adoption duly seconded.)

MR. BRUSH:—It should be borne in mind in some states the hours of service are not optional with the company. The statutes are very clear as to the number of hours employees shall work. In Massachusetts it clearly states nine hours.

(Motion carried.)

The Secretary then read Section (b), under Welfare, "Relief Crew." (See page 340.)

(Motion for adoption duly seconded and carried.)

The Secretary then read Section (c), "Selection of Runs." (See page 340.)

(Motion for adoption duly seconded and carried.)

MR. BRUSH:— May I ask, for the information of our company, whether the majority of the large companies throughout the country now permit their men to pick their runs in order of seniority? Our company at the present time is very much interested in this question. We have had discussion among ourselves as to whether or not a man should be assigned a run or whether he should pick it. Would it not be proper for the gentlemen who represent properties whose men pick their runs, to stand and then the others to give us an idea of the general practice?

SECRETARY DONECKER:— That subject was covered in last year's report.

MR. WELLS:— In Denver we allow the men to vote on their choice of runs every six months, the first of May and the first of November, and then they are marked up for the runs for which they vote according to their seniority on the list.

The Secretary then read Section (d), "Extra Men." (See page 340.)

(Moved, seconded and carried that the recommendation be approved.)

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The Secretary then read Section (e), "Surroundings." (See page 340.)

(Motion for adoption duly seconded and carried.)

The Secretary then read Section (a), "Supervisory Force." (See page 340.)

(Motion for adoption duly seconded and carried.)

The Secretary then read Section (b), "Examination." (See page 340.)

(Motion for adoption duly seconded and carried.)

The Secretary then read Section (c), "Conferences." (See page 340.)

(Motion for adoption duly seconded and carried.)

The Secretary then read Section (d), "Teachings." (See page 340.)

(Motion for adoption duly seconded and carried.)

The Secretary then read section (e), "Follow-up Methods." (See page 341.)

(Motion for adoption duly seconded and carried.)

The Secretary then read Section (f), "Judgment of Work." (See page 341.)

(Motion for adoption duly seconded and carried.)

MR. BRUSH:— I move the adoption of the report as amended and its submission to the companies.

(Motion for adoption duly seconded and carried.)

MR. BRUSH:— If it is proper and in order I move the adoption of the report of the Claim Agents' Association, a joint report as I understand it with this Committee.

(Motion for adoption duly seconded and carried.)

MR. BENNETT:—Through the courtesy of President Shannahan, this being the only available room where the Claim Agents could show the few views that they have along the lines of the prevention of accidents, Mr. F. S. Hughes, of the Public Service Railway Company of New Jersey, who is a field lecturer on the prevention of accidents and first aid to the *uninjured,* will show you these views very rapidly, and I want to thank you now, gentlemen, for the attention you will pay to them, and assure you that you will be repaid for your time.

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MR. HUGHES:— I am not going to attempt to make a talk of any kind, and I am going to run these views on schedule up to about nine points, and it will take some little effort to follow the lesson, but you can grasp it I think at a glance. These pictures are in rotation and interesting, as part of them come from the Pacific Electric System of Los Angeles, some of them from the United Railroads of San Francisco, and a number of them from the Public Service Company of New Jersey. These pictures are used not only in connection with the public schools but with the train men.

(The slides were then rapidly thrown on the screen. They included typical vehicle accidents, wagon, automobile, bicycle, etc. Dangers of the street were shown by colored views of roller skating, running games, " stealing rides " on the part of children and boarding and alighting accidents to men and women.)

MR. BENNETT:— I am sure on behalf of the Claim Agents' Association we thank you, President Shannahan, for the privilege of this meeting here to-day, it being the first time that our Association has met with any of the allied associations, and we hope it will not be the last because it has been of great benefit. I will ask the Claim Agents to adjourn to the meeting room down stairs where we will conclude our program.

(The members of the Claim Agents' Association then retired.)

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THURSDAY MORNING SESSION

October 10, 1912—(*Continued*)

The regular session was then resumed, with President Shannahan in the Chair.

PRESIDENT SHANNAHAN:—The next order of business is the Report of the Committee on Schedules and Time Tables. Mr. Griffin will present the report.

REPORT OF THE COMMITTEE ON CONSTRUCTION OF SCHEDULES AND TIME-TABLES

To the Members of the American Electric Transportation and Traffic Association:

GENTLEMEN.— Your Committee on Construction of Schedules and Time-Tables begs to report as follows:

ANALYSIS OF PREVIOUS REPORTS

The Committee in conducting the work for the present year has concluded that the recommendations developed by this Committee in other years should once again be put before the membership. This subject of the proper construction of schedules is so important from every standpoint that the recommendations made are such as to warrant the Committee in urging the members, if, they have not already done so, to give time and attention to the study of them with a view to applying them in the operation of their roads wherever possible.

Taking up the reports in order, we find in the first report of the Committee, made to the 1910 Convention, the following recommendations:

LAY-OVER TIME

1. That it "either be entirely dispensed with or reduced to a minimum."

ADJUSTMENTS OF RUNNING TIMES

2. That "member companies take due advantage of variations in operating conditions due to fluctuations in traffic, vehicular interferences, etc., by adjusting running times to conform thereto."

PASSENGER COUNTS

3. That there "should be periodical developments of records of passenger traffic" with comparatively short intervals intervening.

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ADJUSTMENTS OF SERVICE TO MEET CHANGES IN TRAFFIC REQUIREMENTS

4. That "member companies should avoid as far as possible the use of inflexible time-tables, but rather treat the established time-table as a basis of operation permitting proper officials to add to or take away from the number of cars in operation, as service requirements of the day seem to demand."

DEFINITIONS OF "STRAIGHT" AND "SWING" RUNS

5. That "the following definitions be approved as interpreting 'straight' and 'swing' runs:"

"A 'straight' run consists of a day's work of an established number of continuous hours, broken only by an interval for a meal," and "a 'swing' run is a run constituting a day's work in which the time composing it is divided into two or more periods with intervals of not less than two hours intervening."

INDIVIDUAL SELECTION OF RUNS

6. A majority recommendation, "that trainmen, in such manner as may be consistent with their seniority of service, be permitted to individually indicate and obtain preferred runs; also that assignments be made as vacancies occur throughout the year and that a general reassignment be made at stated intervals regardless of whether vacancies exist or not."

TRADING RUNS

7. That "the practice wherever followed of permitting trainmen to trade runs at will among themselves be discontinued as against the best interests of the employees."

ASSIGNMENT OF TRIPPER SERVICE

8. That "tripper service should be shown in its proper place on the time-table and the hours of work which this service covers regularly assigned."

SCHEDULE AND TIME-TABLE DEPARTMENTS

9. That "electric railways operating 100 or more 10 to 18-hour cars, install a schedule and time-table department under the jurisdiction of the proper operating official. * * * "On smaller roads * * * that all schedules and time-tables be made by one man especially trained for the work," etc.

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and in 1911, the following additional recommendations:

1. DEFINITIONS:
   Run — A group of trips shown on the time-table which constitutes a day's work for a car crew.
   Run number —An arbitrary number assigned to a run.
   Run guide —An index of the on and off time and the total working time of each run.
   Train number —An arbitrary number or symbol used to designate one trip or a given group of trips.
   Patch —A substitute for a portion of a time-table in effect applied in such a way as to cover parts of the table for the purpose of increasing or decreasing the service.
   Assignment sheet.—An index of the names of car crews assigned to each run.
   Tripper.— One trip, or a group of trips, shown on the time-table for regular operation, but not assigned to regular crews.
   Extra—A trip, or a group of trips, put out to supplement existing service as required but not shown on any time-table.
   Block number.— The Committee has not attempted to define this and would recommend that its use be discontinued.
2. The use of the revolving extra list modified to establish a certain number of hours of work as a day's work for extra men, such extra men not to fall back on the extra list until they have had an opportunity to obtain such stated number of hours' work.
3. That the advantages of possible re-routing of lines be investigated.

INTERURBAN LINES.

4. That the ratio of free running speed to schedule speed be investigated with a view to possible economies.
5. That terminal leaving times be standardized.
6. That the plan of substituting new time-tables when changes are made in old schedules be adopted and the practice of issuing supplements to show such changes be discontinued.
7. That new time-tables be printed on a paper different in color from that used in the time-table superseded.
8. That daily records of passenger business by trains be made.
9. The adoption as standard of the forms of single track and double track working time-tables submitted as a part of this report.

The advantages of standardization along the lines suggested by these Committees are obvious and certainly merit the attention of the members. The Committee would also suggest some further discussion of these recommendations with a view to making such changes, if any, as will best suit the requirements of the largest percentage of the member companies.

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INSTRUCTIONS COVERING THIS YEAR'S WORK

The Executive Committee at its meeting held in November last, issued instructions to the 1912 Committee to investigate the following subjects:

1. Rules for misses.
2. Car house records.
3. Boards showing seniority and working lists.
4. Method of keeping the time of trainmen.
5. Forms of detention reports.
6. Investigation of the practice governing meal reliefs.
7. Classification of trains and information to be shown on time-table, such as speed limits in municipalities, stop numbers and locations, distance between stops and designation of cars that carry mail pouches, stating with regard to the last subject that in the judgment of the Executive Committee, no rules should be included in the time-tables, inasmuch as such practice tended to minimize the importance of other rules not so shown.

Your Committee held its first meeting during the Mid-year Conference week and at that time developed an inquiry form which embodied practically all of the suggestions of the Executive Committee. An inquiry sheet was prepared and sent to member companies, and from this much valuable data has been received and is on file in the Secretary's office. In order that members may have information as to just what statistics have been collected, the inquiry form is included in this report as Appendix A. Two meetings have been held during the year and considerable correspondence has been carried on, all of which has resulted in the following determinations:

Rules for Misses

Attention is directed to the great lack of uniformity in requirements for reporting for work, as shown in Appendix B-1 as well as to the discipline which is applied for failure to report as directed. The variations are not due to the size of road or geographical location, nor even to class of service, that is, as between city and interurban operation. The table shows that the most general requirement is to set the reporting time ten minutes before the time scheduled for the car to depart, though this is frequently reduced to five minutes, and in many cases, no definite time is fixed at all. The above applies to regular men, but generally the same specification holds for extra men, though, of course, there are additional rules with regard to the latter as to periods when they shall report throughout the day.

Appendix B-2 shows the methods of discipline employed for misses or failures to report. In this connection your Committee desires to call attention to what it considers a sharp distinction between an ordinary miss and what might rightly be termed a failure to report for work. A miss, it would appear, is a term that would be applied to an act of an employee through which he actually does report for work

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but does not do so at the proper time but within a short period after the time definitely fixed as his reporting time. The other case, or what, in the opinion of the Committee, should be termed a failure to report, should be considered as referring to an absolute failure to appear at the car house or report by telephone within a fixed period of time after his scheduled reporting time. Your Committee feels that there is considerable difference between the two acts described and is of the opinion that different methods of discipline should be applied to govern each. Your Committee recommends with regard to this subject, as follows:

Reporting for Work — Recommended, that all regular trainmen and extra trainmen having actual assignments be required to report for work 10 minutes in advance of the time set for the beginning of their respective runs; extra men without regular assignment to report at the times called for on working board.

Recommended, that where trainmen are required to begin their runs from points other than car house, that such trainmen, in the event they are unable to reach such starting point, shall be required to so report, by telephone or otherwise, to the dispatcher or other proper officer a sufficient length of time in advance as will permit of another man being sent to the point of relief in advance of the respective scheduled reporting time, failure to so report to constitute a "failure to report," as defined above.

DISCIPLINE FOR MISSES OR FAILURES TO REPORT

In considering the matter of discipline applied in the case of misses or failure to report, the Committee submits appendices which have been developed to accord with what seem to be definite methods as follows:

1. Discipline by reprimand and dismissal, no suspension.
2. Discipline by reprimand, suspension and dismissal.
3. Discipline by retirement to the extra list, no suspension.
4. Discipline by suspension and dismissal.
5. Discipline by merit and demerit system.
6. Miscellaneous methods.

These have been further divided as between city, city and interurban and interurban service only, and we bespeak for the developments the earnest consideration of the members.

The Committee desires to go on record in this report as opposed to disciplinary methods which involve a loss of time, as being practice calculated to cause hardship to employees and their families, to create a feeling of dissatisfaction among said employees and being, therefore, against the best interests both of employees and the company. Discipline by suspension also permits the practice of petty devices by trainmen in order to secure days off, sometimes when they are most needed, and the Committee wishes to express itself as heartily in favor

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of applying discipline for misses on the day of violation of the rule; for instance, when a man fails to report on time, the discipline shall become effective that particular day and the man shall not be permitted to have the day off, which might have been the reason for his not reporting as per schedule.

DEFINING MISSES AND FAILURES TO REPORT

The Committee recommends that:

A "miss" be defined as a failure to report on time, as required by schedule or rule, the trainman actually appearing for work within a short definitely stated period of time thereafter.

A "failure to report" be defined as an actual failure to report at the scheduled reporting time or by telephone or otherwise within a stated period subsequent to such scheduled reporting time.

RECOMMENDED DISCIPLINE FOR MISSES OR FAILURES TO REPORT WHERE MERIT AND DEMERIT SYSTEMS ARE NOT IN EFFECT*

City Lines — Regular and Extra Men

One miss, placed at the foot of the extra list for 1 day, day to begin immediately after trainman has reported.

Two misses within 30 days, placed at the foot of the extra list for day of failure and the following day.

Three misses within 30 days, placed at the foot of the extra list for day of failure and 5 following days.

Four misses within 30 days, liable to dismissal.

For failure to report within a specified number of hours, liable to dismissal.

Interurban Lines

Regular daylight trainmen — 10 days on the extra list for each miss. If three misses occur within thirty days, set back to a night run until another daylight run is open.

Regular Night Trainmen — 10 days on the extra list for each miss, and set back to the top of the extra list if three misses occur within thirty days.

Extra Trainmen — Last choice for work on the day miss is made. If three misses occur within 30 days, placed at foot of extra list.

All Trainmen — Continual misses or indifference to penalties, dismissal from the service.

Car House Records

As will be noted from the data sheet, inquiry was made as to the practice of companies in maintaining records of lost trips, turn-backs short of destination, and as to whether cars actually reach scheduled terminal points, also, as to who is responsible for such records.

* This recommendation disapproved by Convention and ordered striken fron report.

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This question is probably not of pressing importance to the interurban roads, for the reason that most of such properties use some dispatching system and by maintaining a regular train sheet which supplies data to guard against such failures as are noted above and which provides the companies with all necessary information. On city lines, however, the question is more important and the replies indicate that by far the greater portion of city companies are depending upon their trainmen for the fulfilment of schedules. In other words, the Committee has not been able to obtain any records of a systematic checking up of turn-backs, etc., the usual plan being to rely upon the trainmen making such records, though, of course, street inspectors, dispatchers, etc., are frequently in position to and do make note of such matters.

The Committee feels that the lack of a proper method has led, in many cases, to differences between the general public and the operating companies and is of the opinion that frequently short trips are run without the knowledge of the Company. On the few city lines which use dispatching systems in which the trainmen report before leaving terminal points, of course the difficulty is overcome, and in the case of single end operation, little trouble is encountered. There may also be other systems which would serve the purpose, perhaps certain automatic registrations of train movements which would give the company a proper record, but in view of the slight progress the Committee has been able to make in the study during the present year, it strongly recommends that the matter be continued, and that the 1913 Committee give it further attention.

Methods of Keeping Time of Trainmen

This is another subject in which great variation in methods prevails. Your Committee has developed a tabulation showing some of the methods in force and believes that this is a field well worth the study of our members, and one in which accuracy and economies may be effected and standard practice developed.

Among the queries was that of the practice of companies as to time paid for and this developed the fact that there is much difference in plan, many of the companies paying for platform time only, and others paying for different call and reporting times. The Committee feels that this latter is a vital point to all companies and believes that the Association should endeavor to adopt a standard method of paying trainmen for all classes of work, believing that such a standard method would do away with many of the disputes which now arise between employees and operating companies. The Committee, therefore, recommends that this subject be continued for another year and given the thorough study that its importance justifies.

As to the methods of recording time, no comment other than the tabulation is required. One company reports great satisfaction and

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economy in having the trainmen pay themselves. The Committee has no recommendations to make with regard to maintaining the records, believing the subject to be co-ordinate with the standardization of time to be paid for, which is recommended to be continued next year.

Meal Reliefs

In the study of the question of the practice of companies with regard to providing meal reliefs, your Committee finds that, generally speaking, the city lines either provide a meal relief or arrange their schedules in such a way as to allow men certain off-time in which meals may be had. It has developed a small table showing the practice of the various companies and has subdivided by kind of service, and in this table has assumed that where the schedules are so made as to afford the off-time referred to above, that this constitutes a meal relief. On interurban systems it is difficult and often prohibitive to provide meal reliefs and, therefore, your Committee does not feel that a recommendation in favor of the practice is justified.

Seniority and Working Lists

Your Committee in its investigation of these subjects has found the same variety of plans among the member companies which has been noted above in other branches, and has deemed it worth while to make up a tabulation covering some of the methods in use. It calls attention to the variation in the practice of posting such lists, and while not at this time ready to make a definite recommendation as to standard forms of lists or boards, the Committee does heartily endorse the plan of displaying these records for the inspection of the trainmen at all times.

In the case of working lists for extra men, where the statement is made that the lists are posted permanently, we have assumed that where the lists are put out at various times during the day that this constitutes a permanent posting.

Respectfully submitted,

W. R. W. Griffin, *Chairman,*
J. E. Duffy,
R. E. Lee,
C. F. Hewitt,
A. D. Schindler,
C. E. Morgan,
T. F. Grover,

Committee on Construction of Schedules and Time-Tables.

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APPENDIX A

AMERICAN ELECTRIC RAILWAY TRANSPORTATION AND TRAFFIC ASSOCIATION.

OFFICE OF THE SECRETARY.
29 WEST 39TH STREET, NEW YORK, N. Y.

DATA SHEET OF COMMITTEE ON CONSTRUCTION OF SCHEDULES AND TIME-TABLES.

DATA SHEET NO. 84. MARCH 2, 1912.

RULES FOR MISSES.

Please state rules for reporting for work:

Regular men:.....

.....

Extra men:.....

.....

What discipline is applied for failure to report as instructed?

.....

Is your system satisfactory?

.....

What suggestions, if any, have you for improvement?

.....

CAR HOUSE RECORDS.

What records are kept in car house that will indicate the extent to which a given schedule is observed, namely, as to —

Lost trips.....

Turn-backs, short of destination.....

Whether cars have actually reached on each trip the destination points called for on the time-tables.

.....

Who keeps these records?.....

RECORDS SHOWING SENIORITY AND WORKING LISTS.

Describe method of keeping seniority lists (stating form used, that is, loose leaf, book form peg boards, printed or written lists, etc., etc.).

.....

Are these records posted permanently and therefore available for inspection of employees at all times?

.....

If not, how often are they posted, if at all, or how do employees inspect them?

.....

Describe methods of keeping working lists of extra men?

.....

Are these kept posted or only displayed at certain periods daily?

.....

Send copies of both seniority and working list forms.

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APPENDIX A — (Continued)

METHOD OF KEEPING TIME OF TRAINMEN.

Describe your method of keeping time of trainmen. (State whether time clock is used, whether men note on and off time themselves on sheets provided for the purpose, whether men report on and off time to a clerk, or any other way in which the record is made.)

.....

.....

Do you pay for platform time only?.....If not, what plan is used or what time beyond platform time is allowed, such as time for reporting, making out day cards, etc., etc.?

.....

How is this time checked:

In the case of regular men when men are delayed and relief is made at a point away from car house?

.....

In the case of trippers or extra runs?

.....

MEAL RELIEFS.

Describe method of making meal reliefs, indicating whether cars are held over, men thus keeping the same car throughout the run, whether men drop off for a half trip or a full trip, or have a given amount of time, such as half hour, 45 minutes, one hour, etc. ?

.....

.....

Please submit copies of working time-tables and forms of detention reports.

Company.....

Title.....

NOTICE.— This information blank is sent to you in duplicate form. Please fill in the information asked for and return one copy to AMERICAN ELECTRIC RAILWAY ASSOCIATION 29 West 39th Street, New York, N. Y.

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APPENDIX B-1

REQUIREMENTS COVERING REPORTING TIME FOR TRAINMEN, REGULAR OR EXTRA MEN ACTUALLY ASSIGNED FOR WORK.

Required to Report — Minutes Before Scheduled Leaving Time	Service	
	City, and city and interurban. Number of companies reporting	Interurban only. Number of companies reporting
No definite time in advance of scheduled leaving time	15	3
5 min	12	1
10 min	62	8
10 min. in A. M., 5 min. at other periods	1	.....
10 and not more than 20 min	1	.....
10 and not more than 30 min	.....	1
10 min. by telephone	1	.....
10 or 20 min. if unable to report	1	.....
10 or 30 min. if unable to report	1	.....
10 min. or 1 hour if unable to report	1	.....
15 min	5	2
15 min. in A. M., 5 at reliefs	1	.....
30 min. by telephone	1	.....

APPENDIX B-2

METHODS OF DISCIPLINE FOR MISSES OR FAILURE TO REPORT

Method	Service	
	City, and city and interurban. Number of companies reporting	Interurban only. Number of companies reporting
Reprimand and Dismissal (No Suspension):		
Excused or dismissed	1	.....
1st miss reprimand; if continued, dismissed	2	.....
3 misses, dismissed	1	.....
Reprimand, Suspension and Dismissal:		
Reprimand or suspension depending on record	1	.....
1st miss reprimand; 2nd, 1 day; continued, dismissal	1	.....
1st miss, reprimand; afterward, suspension (no time set)	3	.....
Reprimand or 3 days' suspension	1	.....
1st miss, reprimand; 2nd, 3 days; 3rd, dismissed	.....	1
1st miss, reprimand; 2nd, 3 days; 3rd, 10 days; 4th, dismissed	1	.....
Retirement to Extra List (No Suspension):		
2 misses in 30 days, bottom of extra list	1	.....
3 misses in 30 days, bottom of extra list	1	.....
3 days each offense	7	1
4 days each offense	.....	1
4 days each offense; continued, dismissed	1	.....
1–5 days	1	.....
1, 2 days; 2, 3 days; 3 in 30 days, 5 days; 4, dismissed	1	.....
3 misses, 10 days	1	.....
1 and 2, 2 days; then Superintendent disciplines	1	.....
1, 3 days; 2, 5 days; 3, dismissed	1	.....

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APPENDIX B-2 — (Continued)

METHODS OF DISCIPLINE FOR MISSES OR FAILURE TO REPORT—(Continued)

METHOD	Service: City, and city and interurban. Number of companies reporting	Service: Interurban only. Number of companies reporting
RETIREMENT TO EXTRA LIST (NO SUSPENSION) — (*Continued*):		
5 days	1	.....
2 days	1	.....
1, 1 day; 2, 3 days; 3 in 30 days, 7 days	1	.....
1, 2 days; 2, 4 days; 3, 6 days (in 30 days)	1	.....
1, 2 days; 2, 7 days; 3, 30 days; 4, dismissed	1	.....
1 and 2, 2 days; 3 in 90 days, bottom of extra list	1	.....
1 and 2, 1 day; 3, 3 days	1	.....
1, 1 day; afterward longer periods	.....	1
3 misses, bottom of list	1	.....
1, 7 days; 2, 10 days; 3, 14 days	1	.....
1 and 2, 1 day; 3, Superintendent disciplines	1	.....
1, 1 day; 2, 2 days; 3 in 30 days, bottom of list	1	.....
1, 1 day; 2, 2 days; 3, 3 days; 4, 5 days	1	.....
7 days	1	.....
1, 1 day; 2 in 30 days, 7 days; not reporting within 2 hours after miss, 7 days	1	.....
Regulars reporting 1½ hours late, 1 day; otherwise 2 days. Extras 3 times in 30 days, bottom of list. Suspension or discharge if continued	1	.....
7 days; if late within the 7 days 14 days more; if late within the 21 days, bottom of list	.....	1
1, 1 day; 2, 3 days; 3 within 60 days, 7 days, regular men; double for extra men	1	.....
If less than 30 minutes late, 1 day and not recorded; if more than 30 minutes, 1 day and 5 demerit marks	1	.....
1, 1 day; 2, 7 days; 3 within 1 year, 14 days and 1 additional day for each hour or fraction thereof until time of reporting; 4, dismissed or lose seniority	1	.....
10 minutes or less, 1 day; 20 minutes, 2 days; 40 minutes, 3 days; 1 hour, 4 days; over 1 hour, 5 days	1	.....
1, 3 days; 2, 5 days; 3 in 30 days, 10 days; 4, Superintendent disciplines	1	.....
1, 3 days; 2, 5 days; 3 in 30 days, bottom of extra list. Should man miss any relief while serving on extra list, additional day added for each miss	1	.....
1 day for reporting late; failure to report, 3 days	1	.....
2 days if reporting within 1 hour; 4 days for failure to report	1	.....
2 days except if miss occurs on Saturday or Sunday, then 3 days	1	.....
When trainman misses run or fails to report at time set, he shall lose that day, serving as last extra, reporting at all roll calls. When he misses after doing part of a day's work, he shall lose the balance of the day and the next day, serving at foot of extra list, reporting for all roll calls. When he misses a second time within 12 months, trainman will serve 3 days at foot of extra list, reporting at all roll calls. Trainman missing 3rd time within 12 mos. will serve 7 days at foot of extra list and if 3rd miss is made within first 6 months, trainman will be sent to Division Superintendent, to whom satisfactory explanation must be made. Trainman missing 4 times within 12 months will lose his place on list, dropping to extra list until expiration of 12 months from date of his first miss, when he will be restored to his place. For 5th miss within 12 months trainman will be sent to Division Superintendent, and if continued in service, will be required to serve 3 additional months on extra list, before gaining place on list. The above also applies to extra men	1	.....

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APPENDIX B-2 — (Continued)

METHODS OF DISCIPLINE FOR MISSES OR FAILURE TO REPORT — (Continued)

Method	Service	
	City, and city and interurban. Number of companies reporting	Interurban only. Number of companies reporting
RETIREMENT TO EXTRA LIST (NO SUSPENSION) — *(Continued)*:		
1 day, if reporting within 1 hour; after 1 hour, 3 days	1	.....
15 minutes late, 1 day; 15–30 minutes, 2 days; more than 30 minutes, 3 days; 5 in 90 days, regular men go to bottom of list; extra men dropped 3 points permanently	1	.....
Less than 1 hour before 3 P. M., that day bottom of list; more than 1 hour before 3 P. M., 3 days bottom of list; less than 1 hour after 3 P. M., that day and next, bottom of list; more than 1 hour after 3 P. M., that day and 3 days bottom of list	1	.....
MERIT AND DEMERIT SYSTEM	4	3
SUSPENSION AND DISMISSAL:		
1 day; reprimand and sometimes dismissed	1	.....
1 day (day when miss occurs)	8	.....
1 day; reprimand and if continued, dismissed	1	1
Suspension (time not stated)	7	1
1st, 1 day; 2, 2 days; 3, 3 days; 4 in 30 days, dismissed	1	.....
1st, 1 day; 2 within 10 days, 5 days	1	.....
1st, 1 day, 2, 2 days	1	.....
1st, 1 day suspension; 2, 1 week bottom extra list	1	.....
1st, 1 day, regular men; extra men, bottom list	1	.....
2 misses in 7 days suspended	1	.....
10 days	.....	1
3 days or more, depending on previous record	1	.....
3 days	.....	2
3–5 days	1	.....
1st, 3 days; 2, 5 days; 3 within 30 days, bottom of extra list	1	.....
1st and 2nd misses, suspension; then dismissed	1	.....
Saturday, Sunday or holidays, 3 days	1	.....
Reporting late in person but before all scheduled cars have left barn, suspended 1 day. Reporting late 30 minutes after all cars have left barn, suspended 2 days. Failure to report until 2nd reporting time, suspended 3 days. One day will be added to suspension for failure to report for each regular reporting time that passes	1	.....
1, 3 days; 2 in 30 days, 10 days; 3 in 30 days, dismissed	.....	1
Suspended for day but must report for evening rush	1	.....
Regular men 3 days; continued, dismissed. Extra men 3 days at bottom of list, if continued, 7–10 days or suspended. Further continuance, dismissed	1	.....
MISCELLANEOUS:		
$2 fine	1	.....
Each case decided separately	4	1
1st, excused; 2, given night run for 10 days; 3, loses run for 30 days, during which man works last car in at night	1	.....
Trainmen on morning runs having 2 misses in 6 months, assigned to afternoon run indefinitely; trainmen on afternoon runs having 2 misses similarly are assigned to extra list indefinitely. Extra men under same circumstances, suspended indefinitely	.....	1
1st miss, excused; 2, bottom extra list following day; 3 within 1 week, suspended 1 day	1	.....

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APPENDIX B-3

KEEPING TIME OF TRAINMEN

METHODS	Number companies reporting
Time slips prepared by trainmen	*43
Time cards and detention cards	1
Time card on car	3
Taken from trip sheets	*20
Taken from trip sheets and over-time cards	2
Taken from trip sheets and report to foreman for delay time	3
Taken from trip sheets and book register	1
Kept by dispatcher, clerk, starter, etc., to whom trainmen report	27
On and off sheets signed by trainmen	20
Trainmen pay themselves	1
Ohmer register record	1
Trainmen report to check clerk; starter also keeps record which is checked against trainmen's report	1
Peg board, supervised by clerk	1
Paid per run	1
Book record prepared per regular schedule, timekeeper noting changes	1
Time clocks	5

* Checked against schedule and in many cases approved by starter, dispatcher, etc

APPENDIX B-4

MEAL RELIEFS AND METHODS

MEAL RELIEFS PROVIDED?	Kind of line and number of companies reporting	
	City	Interurban
Yes	77	8
No	22	14

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APPENDIX B-4 — (Continued)

MEAL RELIEF AND METHODS — (Continued)

METHODS	Number companies reporting
Crews relieve each other; no relief crews	3
Take second regular car, 40 min. allowed	1
50 min. allowed	1
1 hour allowed	6
1–1½ hours, taking same car	1
1–2 hours	3
3 runs, day, 11 to 11 and split; the 11–11 and split relieve day run noon and night	1
Specified time off	1
Relief crews provided, 1 hour	1
Time given at terminals, no reliefs	4
Night crews relieve day, 1 hour	1
Early day, late day and swing runs; late crew relieves early day crew for dinner and swing crew relieves late day crew for supper	1
On interurban lines motormen only, 1 hour headway and relief man runs to 30-min. point and takes next car back. Conductor eats while car in motion	1
Schedule provides for relief of regular men	1
Dinner reliefs but not supper	1
Reliefs arranged to go one hour; do not use same car	1
Drop off for half trip and then relieve another crew	1
Men drop off for not less than one hour, another crew taking the car	1
Extra crew runs car for 1 or 2 trips	1
Men drop off for part of trip	1
Men switch runs. Three men assigned to 2 runs, giving each man about 11 hours per day. These men relieve each other by going off from one of the runs and coming back on the other run	1
Men have 1 hour for meals and are relieved by regular relief crew, keeping same car throughout day. Men do not receive time when off for meals	1
Average 1 hour standard practice one full trip on short lines, one-half trip on long through lines. Keep same car, first case, operate two cars in second case	1
Meal reliefs made by dinner and supper reliefs, time allowed for meals varying with conditions on each particular scheduled route, it being the aim of the company to relieve men whenever possible at car house or suitable place for them to eat	1
All runs figured with meal reliefs, excepting on one suburban line, where men work about 9 hours straight and allowed to eat meals on car. Conductor, who is broken in as a motorman relieves motorman, this giving him time for lunch on car. Where meal reliefs are made, relief men take the cars from the regular men on the road. Reliefs vary from 1 to 2 hours	1
On 18-hour cars work 2 crews to car. Night crew relieves the day crew about 1 hour and 30 min. for lunch	1
Day crews drop off for 2 or 3 round trips, averaging 2½ to 3 hours, then going on again for 2 or 3 trips	1
Early straight and late straight crews relieved for 1 hour. Late straight crew takes early straight crew, early straight crew dropping off for 1 hour and returning to take swing car. Swing crew relieves late straight crew in evening, late straight crew dropping off for 1 hour, returning to relieve straight crew	1
In addition to usual trip lay-over, additional time is allowed for dinner and supper. Obtained in some cases by putting out extra cars and in others by slightly prolonging intervals between cars	1

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APPENDIX B-5

SENIORITY LISTS

Method	When posted	Number companies reporting
Peg boards	Permanently	8
Peg boards and card system	Permanently	1
Peg boards and loose-leaf	Permanently	1
Board with metal slides	Permanently	2
Blackboard	Permanently	5
Bulletin board	Permanently	2
Printed or typewritten lists	Permanently	29
Printed or typewritten lists	Not posted	22
Loose-leaf	Permanently	3
Loose-leaf	Monthly	1
Loose-leaf	Not posted	6
Card index, written lists	Permanently	3
Card index, written lists	Not posted	1
Card index	Not posted	6
Card index in envelopes, lists	Posted when changes occur	1
Employment record	Permanently	1
Employment record	Not posted	1
Book form	Not posted	17
Book form and lists	Permanently	9
Book form and card system	Not posted	1
Dispatchers' or trainmasters' records	Not posted	2
Dispatchers' or trainmasters' records	Posted monthly	1
None kept		3
Kept for extra men only		1
Memorandum form	Not posted	1
Slips given trainmen, stubs in office, new lists every six months	Not posted	1

WORKING LISTS FOR EXTRA MEN

Method	When posted	Number companies reporting
Bulletin boards, written lists, etc	Permanently or at certain hours of day	63
Bulletin boards and card system	Permanently or at certain hours of day	1
Peg boards	Permanently or at certain hours of day	7
Blackboard	Permanently or at certain hours of day	10
Dispatchers' record only	Not posted	5
Index cards	Not posted	3
Printed or typewritten lists	Not posted	2
Loose-leaf	Not posted	1
Book form	Not posted	3
"Extra men used according to ability"		1

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Discussion of the Report of the Committee on Construction of Schedules and Time-Tables.

The Secretary then read the first and second recommendations for action by the Association, with regard to reporting for work (see paragraph 2, page 385.)

(On motion duly seconded, the recommendation was approved.)

The Secretary then read the next recommendation, "Defining 'Misses' and 'Failures to Report.'" (See page 386.)

(On motion duly seconded, the recommendation was approved.)

The Secretary then read the next recommendation, "Discipline for 'Misses' and 'Failures to Report,'" as follows: see page 386.

(On motion, duly seconded, the recommendation was disapproved.)

The Secretary then read the next recommendation regarding "Car House Records" (pages 386 and 387).

PRESIDENT SHANNAHAN:—There being no objection that will be done.

SECRETARY DONECKER:—The same thing maintains with regard to the "Methods of Keeping the Time of Trainmen."

PRESIDENT SHANNAHAN:— No objection, and it is so ordered.

The Secretary then read the next section with regard to "Meal Reliefs" and also the section referring to "Seniority and Working Lists." (See page 388.)

WRITTEN DISCUSSION

MR. JACKSON:—This question of layover time is one that should be seriously considered, as too much will eat up a great deal of money in a year. While in all cases it cannot be entirely eliminated, it should after careful consideration be cut to a minimum. Layover time on any line is governed entirely by the running time. For example, your time on a given line is twenty-nine minutes one way, or fifty-eight minutes for the round trip; you are operating a three, four, five, six or seven and a half minute headway; these intervals being the multiple of an hour and you must allow sixty minutes to make the trip.

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When you have a graduated headway you cannot avoid conceding more or less stand time if you wish to operate an equalized headway. You must also allow for the changing of fender and trolley pole, as it is not always possible to obtain loops or wyes, therefore layover time cannot be entirely dispensed with, but it can be reduced to a minimum, which you will find to be governed by local conditions.

Regarding the adjustment of running time, I do not think it advisable to cut the running time during the day, say between 9.00 A. M., and 4.00 P. M,. as that is when vehicular traffic is at its height. All trucking is done between the hours of 7.00 A. M., and 6.00 P. M. Your department store delivery wagons are continuously pulling out of the side streets regardless of whether a car line is operated or not. I believe that by cutting your time during the non-rush hours you are opening up a condition where you are liable to increase the number of accidents, and cause the abuse of equipment. After you have cleared your P. M. rush, say between 7.00 and 12.00 P. M., there are many lines that can be speeded up with safety, as all vehicular traffic is off the street, and all you have to look out for are the "joy riders" in automobiles, which I can assure you are a source of worry.

I would suggest a systematic check be made on all lines and if it is found that your trainmen are continually running ahead of schedule time, study the condition and perhaps between your layover and time points you are able to save a car by making a combination that will not materially affect the traveling public or your men. I find very few places where during the A. M. rush cars run behind schedule time, and any slight cut made between 9.00 A. M., and 4.00 P. M., can be made from 6.00 A. M. The bone of contention is the evening rush from 4.30 to 7.00 P. M.; that is when the time is lost, and I would recommend allowing extra time between these hours, or allow enough layover to cover the average time lost, so that cars can leave the terminal on scheduled time. This can be done easily by manipulating your pull-in cars. Do not make too many changes in your time points, as I have found out by experience that it confuses your men.

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In reference to passenger counts, I do not see how any company operating two hundred or more cars can get along without periodical developments of records showing passengers carried on their cars, especially during the rush hours. I do not think the inspector in charge of a line should be detailed to do this work as it is false economy; he should cover the road and see that all cars are on schedule time or know the reason why. I am in favor of placing young men "car timers" at the heaviest point on a line during rush hours whose duty it is to count the number of passengers on each car noting the car number and time, this record to be charted on tracing paper from which blue prints are made and copies sent to the superintendent of transportation's office and from there to the superintendent or supervisor in charge of the line. When this record is completed it will show at a glance the number of passengers on each car, the time it arrived, and the average number of passengers in half-hour periods. It will also show the headway that is scheduled to pass the point where record was taken and the actual headway passing; the scheduled number of cars in half-hour periods, and the actual number that did pass. I expect to also show on this chart in addition to the actual time each car passed, the time it should pass and the minutes ahead or late as the case may be, this to apply to lines on five minute headway or longer. These charts are watched closely and when an overcrowded or light condition is found, the record is taken for at least three consecutive days, from which a composite chart is made showing the average riding per day. When tables are changed accordingly. No table being changed for any one day's record. These passenger counts should be made on heavy trunk lines once a week if possible, and studied closely.

The adjustment of service to meet changes in traffic requirements is governed to a great extent by local conditions, and on operating lines running to seaside, lake resorts, or picnic grounds, the riding depends upon weather conditions. I would suggest that your timetables be made up on a minimum basis, that is, under ordinary circumstances, to take care of the regular business on your line you only need a five minute

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headway, make your schedule accordingly, then have several patches made so that you can operate a four, three, two and one-half or two minute headway as the travel warrants. This you will find the most economical operation, and a system by which you can save considerable. As I said before this is a local condition and you must be governed accordingly.

The recommendation of your Committee that trainmen be allowed to pick their runs should be followed out where practicable, as you will find out in a short while that it works to better advantage than the system of signing them up in seniority. It does away with the dissatisfaction that a sign-up on a new timetable sometimes creates and will have a tendency to abolish the desire on the part of your trainmen wishing to trade runs, which practice should not be allowed. Your men should have the privilege of picking their run on each new week day table, and at a car house from which more than one line is operated, every six months a general pick should be allowed, irrespective of whether your tables are changed or not.

Regarding tripper service. All trips that go to make up your main line headway should be incorporated in and shown on your timetables as this service is part of the standard.

Schedule and timetable departments should be established on all roads operating from ten to eighteen hundred car hours per day, even if it be composed of only one or two men. In a very short while you will readily see that a great deal of money can be saved by having your timetables checked up and watched in a systematic manner.

MR. BRUSH:— Mr. President, I move the report as a whole be adopted as amended.

(Motions duly seconded and carried.)

PRESIDENT SHANNAHAN:—The next order of business is the paper prepared by Mr. S. R. Inch, on "One Man Prepayment Car Operation."

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ONE-MAN PREPAYMENT CAR OPERATION

By S. R. INCH, *General Manager,*

Missoula Street Railway Company, Missoula, Montana.

While the operation of one-man cars is not a new thing, it is only within the past three years that a type of car has been developed which has made such operation free from difficulty and danger, and has secured not only economy in platform expense, but has also provided adequately for the safety of the public, for the collection of fares, and for the maintaining of reasonably fast schedules.

Until very recently, the operation of one-man cars was limited to the smallest systems or to very unimportant feeder lines of the larger systems, where, if need be, cars could be stopped while fares were being collected, or where the company was willing to take long chances by having the motorman run the car at a slow rate of speed and then leave his controller and collect fares while the car was in motion.

The defects of the system when so operated were so many and so obvious that the use of the one-man cars fell into merited disrepute, and even now cause many experienced street railway men to look with suspicion upon suggestions that one-man car operation can be made perfectly satisfactory in every way.

Recent experience, however, seems to prove that in most cities of 50,000 people or less one-man prepayment cars can be operated under the same schedules and handle the same traffic as two-man cars of the prepayment type with the positive advantages of greater freedom from accident and reduced operating expenses.

In order to secure such a result however, it is necessary to go to the other extreme from the dilapidated equipment, the poor track and the ragged overhead work which often characterized the one-man systems of the past, for the successful one-man system of today will need to be equipped with first-class rolling stock and its track and overhead work must be kept in good shape.

There are now several places where one-man prepayment cars of the general type herein recommended are in use, but so far as I know the first system to be designed specially for one-man operation along these lines, and to be continuously and exclusively operated as such, is the one with which I am connected, and which is one of a number of public utility properties in Montana owned by Senator William A. Clark.

In view of the interest which the smaller member companies appear to take in the operation of one-man cars and the altogether satisfactory results we have secured in Missoula, Montana, during a period of more than two and a half years with such cars, it may be desirable to state briefly the history of the Missoula Car and the benefits we have derived from its use.

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The lines of the Missoula Street Railway Company were built in 1909, and the one-man car we use was designed in April of that year. The problem which we set ourselves to solve in its design was the reduction of operating expense without any corresponding sacrifice in matters of safety and schedule. In planning the operating methods to be adopted by our company, the question of operating expense was, as everyone who is familiar with the inter-mountain states will readily believe, a very serious matter indeed with us, for wages in Montana are from 50 per cent to 100 per cent higher than in either the Eastern or the Pacific Coast States, while income is based on the universal five-cent fare and therefore is no greater than elsewhere. It was very evident that unless operating expenses could be cut materially below the ordinary figures, we could not expect to pay our way, and this meant that we must reduce to a minimum the number of men employed. This we did in two ways; first, by the elimination of the entirely unnecessary conductor and adding his duties to those of the motorman; and second, by adopting reasonably fast schedules and reducing lay-overs to a minimum in order to give good service with relatively few cars. Having decided upon the above methods of reducing operating expense, it remained to design a car and develop a system of operation which should preserve all the benefits of two-man operation.

THE CARS

In order to safely maintain the fast schedules necessary for reasonably good service in a scattered district operated with comparatively few cars, and to do so with comfort to our passengers, we adopted double-truck cars exclusively, and equipped them all with air brakes.

City cars are double-end, thirty-two passenger, Brill semi-convertible cars, 39 ft. 9 in. in over-all length, mounted on maximum traction trucks, and equipped with two G. E. 219 interpole 600 volt motors.

On our interurban line, we use a single-end, fifty-two passenger car, 46 ft. 0 in. in over-all length, mounted on M. C. B. trucks and equipped with four motors of the above mentioned type. Steel wheels are used throughout, driving wheels being 33 in. in diameter. The gear ratio on all cars is 15:71.

THE PLATFORMS

The platforms are 6 ft. long and are arranged so that passengers both board and alight at the same platform and at the same side of the car. The double folding vestibule doors, together with corresponding folding steps, are operated by hand levers under the control of the motorman, and on some of the cars the bulkhead doors are similarly controlled. On the platform is a Brill 4A fare box. Railings are used to divide the platforms into three sections for boarding and alighting passengers and for the motorman respectively. There are no grab handles visible when the car doors are shut, and the steps

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fold up so as to afford no foothold; the bumpers are provided with inclined metal shields to prevent persons riding on them and the vestibule windows are guarded to prevent people from climbing in at the rear end of the car to escape paying their fare. The rear platform is used as a smoking compartment, the doors of the same being securely locked.

The floor plan of our standard car shown herewith will give a good idea of the special platform arrangement.

SYSTEM OF OPERATION

Passengers both board and alight at the front platform and at the same side of the car. The car is brought to a complete stop before the doors are opened, and the doors are closed before the car is started.

The cars stop at the near side of intersecting streets, which places the front platform opposite the sidewalk, and are not stopped to take on or discharge passengers except at street intersections.

Push buttons placed in every side post enable passengers to notify the motorman of their desire to alight, and in response to such a signal the car is stopped at the near side of the next street intersection.

Fares are collected by means of a fare box, and the motorman is required to make change and issue transfers, which must be asked for when the passenger pays his fare. In order to get a check on car receipts, we have adopted a method of run rotation, so that each man's receipts are checked by the receipts of other men on the same run. The plan has worked satisfactorily, not only by permitting comparisons, but by preventing undue familiarity between motormen and regular passengers, a trouble much in evidence in small systems.

SCHEDULES

With the cars so operated and with a working day of eighteen hours, city cars make an average of 4,300 miles per month, while on the semi-interurban lines a car makes an average of 8,800 miles per month. The schedule speed on the city lines, including lay-overs, is practically eight miles per hour, and on one of the interurban runs is 16.4 miles per hour.

The regular headway on the city lines is fifteen minutes, but our lines are so arranged that nearly all cars pass through the center of town, where we have laid double track. This arrangement gives us a five-minute schedule for three-quarters of a mile through the down-town section.

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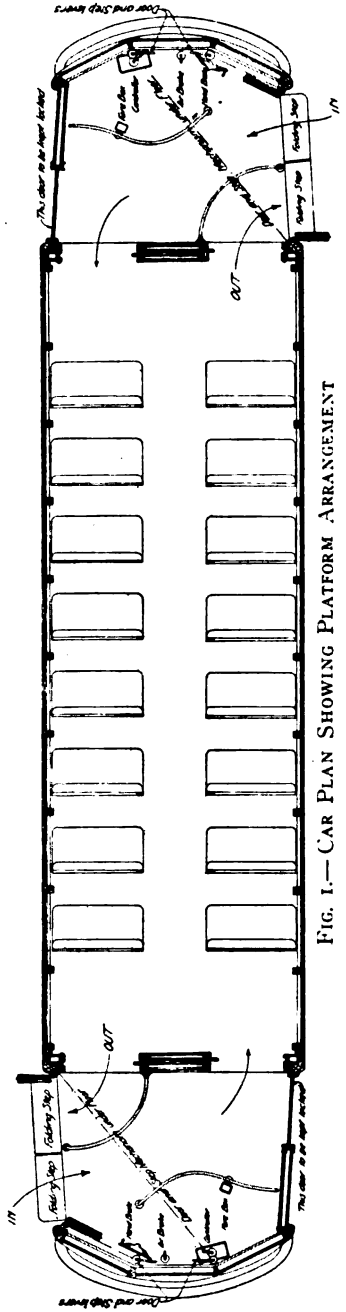

FIG. 1.—CAR PLAN SHOWING PLATFORM ARRANGEMENT

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ACCIDENTS

It will no doubt be acknowledged that for all systems attempting fast schedules the use of cars having closed doors and folding steps is desirable, and the use of such cars is spreading so rapidly that most such systems are at least partly equipped with cars of this kind.

For the one-man system. the use of cars of this type may be considered essential, and, as with two-man systems, the number of platform accidents will be thereby greatly reduced.

It is, I think, fair to claim for one-man cars so equipped, and with passengers boarding and alighting at the front platform under the immediate observation of the motorman, a distinct and positive advantage for the one-man car as compared with the ordinary two-man car, for it removes the division of responsibility as to the starting of the car which has been such a frequent cause of platform accidents. Particularly is this true as regards the bell signal for starting, which may be, and often is, given by a passenger or other unauthorized person.

Unquestionably, the boarding and alighting of passengers from the front platform is the most essential feature of the one-man car and that which in connection with the closing up of the car when in motion, and the near-side stop, makes its use perfectly feasible without any impairment of existing service in many places where two-man cars are now being operated.

In the past two and a half years our cars have made nearly a million car-miles, practically without accident and absolutely without a single accident which could in any way be charged to one-man operation.

HANDLING TRAFFIC

The fear has been expressed that the one-man car would be hard to load to capacity, and that even the handling of ordinary traffic would be delayed due to the time taken to collect fares and make change. If this is made a general criticism of all prepayment cars with platforms closed when in motion, it must be admitted that the criticism is just as compared to cars on which passengers are allowed to board and alight while the cars are moving. However, the faster speeds at which closed platform cars may be safely operated makes the net delay very small even in large cities, and since the delay to one-man cars from this cause is no greater than in the case of two-man cars, it becomes altogether negligible in any place where the use of one-man cars would be feasible.

On many occasions, we have had 120 passengers on our 32-passenger cars, with the car in charge of one man as usual. With most small systems, however, the handling of large standing loads is unfortunately rare and the one-man car is not recommended for places where such profitable conditions are the rule rather than the exception.

Making change and issuing transfers sometimes causes slight delay,

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but much less than might be thought and certainly not enough to be a serious disadvantage. In this connection it may be said, that while the use of tickets would be of some advantage to us as saving the delay incident to making change, we have not found delay of this kind sufficient to cause us to offer tickets for less than five cents straight.

The issuing of transfers might be more serious however, where the number issued is large and where the usual transfer is used. Delay from this cause can be largely avoided by the use of transfers specially prepared for the purpose. We have devised a transfer which suits our conditions very well, and which is illustrated by the accompanying cut.

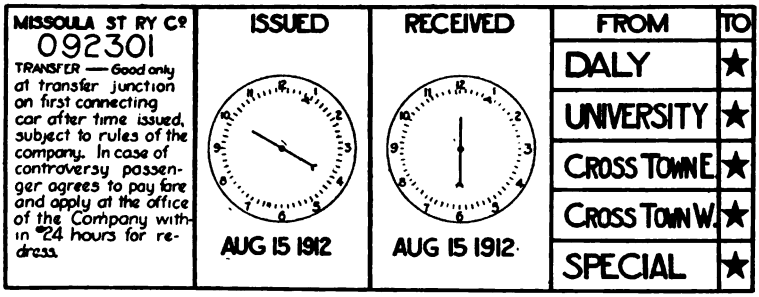
MISSOULA ST RY Co
092301
TRANSFER — Good only at transfer junction on first connecting car after time issued, subject to rules of the company. In case of controversy passenger agrees to pay fare and apply at the office of the Company within 24 hours for redress.
ISSUED
AUG 15 1912
RECEIVED
AUG 15 1912
FROM
TO
DALY
UNIVERSITY
CROSS TOWN E.
CROSS TOWN W.
SPECIAL

FIG. 2 — FORM OF TRANSFER USED

OTHER CRITICISMS

It has also been suggested that with the one-man system it would be impossible to deal with rowdyism on the cars, and to prevent people from stealing rides. It is our experience that the latter trouble can be altogether prevented by the proper construction of the car and although one of our lines runs to a military post, another to a large lumber camp, and still another to a State university, offering it would seem ample opportunity for all gradations of rowdyism from meanness to mischievousness, we find that all these lines are satisfactorily served with one-man cars and that trouble of the kind mentioned is exceedingly rare.

Another criticism refers to the possibility of the sudden illness or death of the motorman. Exactly the same criticism applies to the operation of most interurban lines, where the motorman is so separated from the balance of the crew that they would probably not know of any such mishap to him for some time, and in a lesser degree to the operation of ordinary city cars where it is quite possible that the conductor would not immediately know of the motorman's condition. The fact is that the possibility of such an accident is so very remote that it is not given much consideration in any surface system. However, if it was thought desirable, it would be quite feasible to develop a "dead-man's handle" for the Type K controller commonly used on city lines,

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and, in addition, to use automatic stopping devices in connection with signals on interurban lines.

I have been asked by some street railway men who have inspected our system whether we do not have a lot of trolley trouble due to the one-man operation. At first, we did have a good deal of trouble from this cause, but it has been almost entirely avoided by putting a trolley pole at each end of the car, located immediately above the king bolt of the truck, by the use of trolley catchers, and most important of all, by the use of Detroit type trolley frogs located very carefully and securely. We find also that the use of 6 in. high-speed, deep-groove trolley wheels throughout is of some advantage. Altogether, the result is that it is now a most rare occurrence for us to have a trolley leave the wire.

ATTITUDE OF THE PUBLIC

When we decided to adopt one-man cars, we realized that we should meet with criticism from the public, and that some people would be antagonistic to the plan. Indeed, we anticipated much more trouble from this source than we actually experienced and what little trouble of this kind we actually had was of very short duration, and has now altogether died out. The public has found that no accidents have resulted from the one-man plan, and apparently realize too that it has enabled us to give better and more frequent car service than we otherwise would be able to do. In this matter we have appealed to the enlightened self-interest of the public which we serve, and have found that a frank discussion of the benefits of more lines and more cars which the reduction of operating expense due to the one-man plan has made possible are now well understood in our community and that following this understanding has come public endorsement of the system.

We recognize that the attitude of the public is also very largely the attitude of the courts, for accident suits against public corporations nearly always get to a jury, and jurors are often guided more by prejudice and preconceived ideas than by considerations of law or evidence. It is therefore of great importance that any system of operating a public service like a street railway should be such as to impress the public that it is a safe and proper system of operation. Believing that the attitude of the general public toward things of this kind is likely to be pretty much the same in one place as in another, I feel that the satisfaction of the people of Missoula may be taken as the ultimate attitude which the people of any town would take where the system was properly applicable, and properly introduced.

ATTITUDE OF EMPLOYEES

Equally necessary to the success of the system is a proper attitude on the part of the company's employees. This, also, we were uncertain of when we first commenced operations, particularly in view of the

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fact that all our men were experienced motormen who had been in the service of companies operating two-man cars. In order to gain the men's support, we appealed, as in the case of the public, to their self-interest; first, by paying a bonus of five cents per hour for one-man operation, and second, by so equipping the cars as to reduce the labor of running them to a minimum. The result has exceeded our expectations and now the men themselves are as enthusiastic about that one-man idea as the officers of the company could wish.

It is no doubt a fact that less prejudice on the part of the public and less antagonism on the part of the employees to departures from the ordinary method of operation are to be expected in the starting of a new street railway system, such as ours, than in making changes of a similar character on an existing system.

It is, however, easy to over-estimate this advantage for the population of any town where a street railway would be built is composed largely of people who are familiar with ordinary methods of street car operation, and who, consequently, will view any innovations of a radical nature with a good deal of suspicion.

I think that companies now operating two-man cars who might try the operation of one-man prepayment cars would find the fact that several such systems are now in successful operation would be of greater advantage to them in attempting to introduce one-man cars than the fact that our system was installed where there had not previously been any car service was to us.

RESULTS

In Missoula and its surroundings, with a total population of about 17,000, the Missoula Street Railway Company, using one-man prepayment cars over an equivalent of 19 miles of single track under reasonably fast schedules, has during the past two and a half years profitably operated eight regular double truck cars, carried, including interurban business, over 2,500,000 passengers, and run nearly a million car miles without a serious accident.

Nothwithstanding that car-men's wages in Montana are probably higher than anywhere else in the United States, being in Missoula from 35 cents to 40 cents per hour according to length of service, operating expenses have been kept below 14 cents per car-mile, and it is believed can be still further reduced.

This makes an interesting comparison with the figures given in the United States Census of Street and Electric Railways in 1907, where the average operating expense for all systems having a gross income of less than $500,000 a year was shown to be 16.8 cents per car-mile. The census figures are based upon the average rate paid throughout the whole country to motormen and conductors, which is less than 70 per cent. of the average rate paid in Montana. These comparisons

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appear to show that if in Montana one-man cars can be operated for 14 cents per car mile, very much lower unit costs should be obtainable in places where car-men's wages are nearer the average rates.

Our annual saving, due to one-man operation, is now about $15,000 a year, and this will increase as the system grows, as it must do in a town which has trebled its population between the census of 1900 and that of 1910.

It is my belief that similar results can be obtained by any company operating in a town or city of, say, 50,000 population or less, under ordinary conditions, and that in such a case it is probable all the lines could be well served with one-man cars. It also seems probable that many of the larger systems could safely adopt the plan for suburban lines, which do not go through the downtown districts. In this connection it should not be overlooked that there are now several street railway systems using up-to-date one-man prepayment cars, and that these are widely distributed geographically, so that it may be assumed that the plan has passed the experimental stage, and has proven successful under widely varying conditions.

If any additional evidence is needed, surely the fact that in St. Paul and Minneapolis cars having platforms closed while in motion have been successfully used for many years may be taken to dispose of the criticism that this feature of our plan is not feasible in the comparatively small cities for which one-man cars are herein recommended. In this connection reference may also be made to the instant approval which the traveling public accorded to the Near-Side Car recently adopted in Philadelphia; this car, while used in Philadelphia as a two-man car, having the conductor stationed on the front platform with the motorman, would seem to make an excellent one-man prepayment car for places where the traffic is light. This car, in all its main operating features, seems to be very similar to the Missoula car, although the platform arrangement and general construction of the car are quite different.

The Near-Side Car seems to have proved that even in a large city the near-side stop, the use of closed vestibule doors and folding steps, the boarding and alighting of passengers from the front platform, and the other operating methods we have adopted in Missoula, are correct and desirable.

Considered together with the excellent results already obtained by other systems using one-man cars, the success of the Missoula Car would seem to go far in support of my contention that in most towns and cities of comparatively small size the use of cars operated as herein described will make the employment of conductors an unnecessary expense offering no compensating advantages.

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PRESIDENT SHANNAHAN:— I am sure Mr. Inch is quite willing to answer any questions that any of you gentlemen may care to ask him.

Discussion of Mr. Inch's Paper.

MR. EMMONS:— I have read the paper, and I would like to ask Mr. Inch, just how he takes care of his railroad crossings with one man operation.

MR. INCH:—We simply make it incumbent upon the motorman to make a positive stop. At any point where there is a descending grade to a railroad crossing, we call for two positive stops, one at the top of the grade and one about thirty feet from the grade crossing. We have two grade crossings and we have had no trouble so far.

MR. EMMONS:— Has there been any agitation to require through the Council, two men on a car? Some of our Indiana ordinances require two men.

MR. INCH:—There was an attempt at the last session of the Montana Legislature of 1911 to have a law passed which would make us employ two men, but to meet that I had a number of the members of the legislature come to Missoula, to ride around on one of our cars in regular service, and they were so impressed with the practicability of the scheme, that they went back and influenced their friends in our favor and the law was not passed. I think there has been some disposition since that time on the part of some of the labor men to make trouble of this kind but we have the support of our own motormen because we give them an additional five cents an hour for one man operation, and they have found they can do the work very nicely and consequently they are with us in the matter and their local union is favorable to one man operation.

PRESIDENT SHANNAHAN:—Are there any more questions any of your gentlemen care to ask?

Hearing none, we will proceed with the next order of business. Is there any other business or any new business to come before the house? Hearing none I will call on the chairman of the Committee on Resolutions, Mr. E. C. Faber.

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REPORT OF COMMITTEE ON RESOLUTIONS

To the American Electric Railway Transportation and Traffic Association:

Gentlemen:— The Committee on Resolutions appointed by your president, has pleasure in submitting following report:

WHEREAS, The flourishing condition of this Association testifies to the devoted skill of the officers and committees of this organization, and

WHEREAS, The entire program arranged for the benefit of our members clearly indicates the conscientious efforts of the members of your Executive Committee in the selection of useful and interesting subjects, and the reports as presented have evidenced energetic work on the part of each one of the members of the different committees, now therefore

Be it resolved, That the members of the Transportation and Traffic Association beg leave to record their grateful appreciation of the faithful, efficient, conscientious way in which Mr. McCarter, President of the American Association, and President Shannahan, Secretary Donecker, the officers and Executive Committee members and members of the fourteen standing and special committees of this Association have executed the duties imposed upon them.

Be it further resolved, That the hearty thanks of this Association be tendered the American Electric Railway Manufacturers' Association for the long-timed and growing co-operation in our work; for its highly successful contribution to the success of this Convention, and for the spirit of helpful good fellowship displayed by its members on all occasions.

Be it further resolved, That the President on behalf of the Transportation and Traffic Association assembled send to Mr. McCarter a telegram expressing regret at his inability to be present and wishing for him speedy and complete recovery.

Be it further resolved, That the thanks of our membership be, and they are, hereby tendered to the Saddle and Sirloin Club for the use of their rooms for the holding of our meetings.

E. F. C. FABER, *Chairman.*
E. F. PECK,
L. C. BRADLEY,
Committee on Resolutions.

(On motion, duly seconded, the report was adopted.)

PRESIDENT SHANNAHAN:—The next order of business is the Report of the Committee on Nominations, Mr. J. K. Choate, Chairman.

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REPORT OF THE COMMITTEE ON NOMINATIONS

To the American Electric Railway Transportation and Traffic Association:

Gentlemen:—Your Committee on Nominations begs leave to report the following nominations for officers for the year 1912–13:

For President, Dana Stevens, of Cincinnati, Ohio.
For First Vice-President, D. A. Hegarty, of New Orleans, La.
For Second Vice-President, M. C. Brush, of Boston, Mass.
For Third Vice-President, H. A. Nicholl, of Anderson, Ind.
For Secretary and Treasurer, H. C. Donecker, of New York, N. Y.
For members of the Executive Committee, C. B. Buchanan, of Richmond, Va.; W. R. W. Griffin, of East Liverpool, Ohio; L. C. Bradley, of Galveston, Texas; and J. McMillan, of Los Angeles, Cal.

PRESIDENT SHANNAHAN:—You have heard the report of the Committee. What is your pleasure?

It was moved that the Secretary cast one vote for all the officers nominated.

(Motion duly seconded and carried.)

The Secretary then cast the vote of the Convention for the gentlemen nominated and they were declared elected.

PRESIDENT SHANNAHAN:—Mr. Dana Stevens whom you have just elected as your new President was forced to return to Columbus last night and for that reason we will not have the pleasure of inducting him into office. Is there any further business to come before this meeting? If not, the chair declares the meeting adjourned *sine die*.

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CONTRIBUTORS TO DISCUSSIONS

The following is a complete list of the names, official titles and addresses of those who participated in the discussions at the Convention of the Transportion and Traffic Association.

The page references will be found in the *General Index.*

Ackerman, E. O., Engineer, Maintenance of Way, Columbus Railway & Light Co., Columbus, Ohio.

Adams, H. H., with Ford, Bacon & Davis, New York, N. Y.

Allen, C. L., President, Newport News & Old Point Railway & Electric Co., Hampton, Va.,; Syracuse Rapid Transit Railway, Syracuse, N. Y.

Badgero, M., General Manager and Auditor, Syracuse & Suburban Railroad Co., Syracuse, N. Y.

Benedict, H. A., Mechanical Engineer, Public Service Railway Co., Newark, N. J.

Bennett, H. K., Claim Agent, Fitchburg & Leominster Street Railway Co., Fitchburg, Mass.

Blakeslee, R. B., Superintendent, Du Bois Traction Co., Du Bois, Pa.

Boyce, W. H., Superintendent and Park Manager, Beaver Valley Traction Co., New Brighton, Pa.

Boylan, M. R., General Auditor, Public Service Railway Co., Newark, N. J.

Bradley, L. C., Vice-President and General Manager, Galveston-Houston Electric Co., Galveston, Texas.

Brown, J. Q., Assistant to General Manager, San Francisco–Oakland Terminal Railways, San Francisco, Cal.

Brown, J. W., Assistant Superintendent, Public Service Railway Co., Newark, N. J.

Brush, M. C., Second Vice-President, Boston Elevated Railway Co., Boston, Mass.

Burleigh, J. J., Second Vice-President, Public Service Railway Co., Newark, N. J.

Callaghan, W. C., Superintendent Transportation (City Lines), New York State Railways Co., Rochester, N. Y.

Cameron, Bruce, Superintendent of Transportation, United Railways Company of St. Louis, St. Louis, Mo.

Carson, George, Claim Agent, Puget Sound Traction, Light & Power Co., Seattle Division, Seattle, Wash.

Case, F. E., General Electric Co., Schenectady, N. Y.

Choate, J. K., General Manager, Otsego & Herkimer Railroad Co., Cooperstown, N. Y.

Cherry, T. C., General Manager, Maryland Electric Railways Co. (The), Annapolis, Md.

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Clark, R. J., Comptroller, Kansas City Railway & Light Co., Kansas City, Mo.

Coen, F. W., General Manager & Purchasing Agent, Lake Shore Electric Railway Co., Sandusky, Ohio.

Collins, J. C., Secretary, New York State Railways, Rochester, N. Y.

Collins, W. H., General Manager, Fonda, Johnstown & Gloversville Railroad Co., Gloversville, N. Y.

Crafts, P. P., General Manager, Iowa & Illinois Railway Co., Clinton, Iowa.

Crecelius, L. P., Superintendent of Power, The Cleveland Railway Co., Cleveland, Ohio.

Donecker, H. C., Secretary-Treasurer, American Electric Railway Association, New York, N. Y.

Duffy, C. N., Vice-President, Milwaukee Electric Railway & Light Co. (The), Milwaukee, Wis.

Ecker, E. C., Assistant to General Manager, Chicago Railways Co., Chicago, Ill.

Emmons, C. D., General Manager, Chicago, South Bend & Northern Indiana Railway Co., South Bend, Ind.

Faber, E. C., General Manager, Aurora, Elgin & Chicago Railroad Co., Wheaton, Ill.

Forse, W. H., Jr., Secretary and Treasurer, Union Traction Company of Indiana, Anderson, Ind.

Franklin, C. J., General Superintendent Railway Department, Portland Railway, Light & Power Co., Portland, Ore.

Glover, M. W., Secretary and Auditor, Mobile Light & Railroad Co., Mobile, Ala.

Hammond, E. H., Superintendent, Elmira, Corning & Waverly Railway Co., Elmira, N. Y.

Harvie, W. J., President, Pottsville Union Traction Co., New York, N. Y.

Hegarty, D. A., Manager, New Orleans Railway & Light Co., New Orleans, La.

Henry, C. L., President, Indianapolis & Cincinnati Traction Co., Indianapolis, Ind.

Hixson, L. T., Auditor, Terra Haute, Indianapolis & Eastern Traction Co., Indianapolis, Ind.

Hoge, J. B., President, Automatic Signal and Appliance Co., Cleveland, Ohio.

Hovey, M. H., Signal Engineer, Indiana Railroad Commission, Indianapolis, Ind.

Hughes, F. S., Safety Lecturer, Public Service Railway Co., Newark, N. J.

Hyman, E. H., General Manager, Electric Package Agency, Cleveland, Ohio.

Inch, S. R., General Manager, Missoula Street Railway Co., Missoula, Mont.

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Jackson, Andrew, Superintendent of Time-tables, Public Service Railway Co., Newark, N. J.

Jeffries, G. K., General Superintendent, Terra Haute, Indianapolis & Eastern Traction Co., Indianapolis, Ind.

Johnson, H. A., Master Mechanic, Metropolitan West Side Elevated Railway Co., Chicago, Ill.

Kilbride, M. D., Superintendent Transportation (Interurban Lines) New York State Railways Co., Rochester, N. Y.

Lamb, O. S., Superintendent, Waterloo, Cedar Falls & Northern Railway Co., Waterloo, Iowa.

Leisenring, John, Signal Engineer, Illinois Traction System, Springfield, Ill.

Litchfield, Norman, Engineer Car Equipment, Interborough Rapid Transit Co., New York, N. Y.

McCarthy, P. O., Superintendent, Fort Smith Light & Traction Co., Fort Smith, Ark.

McMillan, J., General Manager, Pacific Electric Railway Co., Los Angeles, Cal.

Matthews, C. H., Assistant Superintendent Transportation, Georgia Railway & Power Co., Atlanta, Ga.

Nachod, C. P., General Manager, Nachod Signal Co., Philadelphia, Pa.

Nicholl, H. A., General Manager, Union Traction Co. of Indiana, Anderson, Ind.

Norviel, F. D., General Passenger and Freight Agent, Union Traction Company of Indiana, Anderson, Ind.

Palmer, G. W., Jr., Electrical Engineer, Bay State Street Railway Co., Boston, Mass.

Pantell, F., Auditor, Chicago, Lake Shore & South Bend Railway Co., Michigan City, Ind.

Peck, E. B., Vice-President, Terre Haute, Indianapolis & Eastern Traction Co., Indianapolis, Ind.

Richey, A. S., Professor Electric Railway Engineering, Worcester Polytechnic Institute, Worcester, Mass.

Rockwell, W. B., Manager, Eastern Pennsylvania Railways Co., Pottsville, Pa.

Sawyer, W. H., with Ford, Bacon & Davis, New York, N. Y.

Schneider, E. F., General Manager and Purchasing Agent, The Cleveland, Southwestern & Columbus Railway Co., Cleveland, Ohio.

Shannahan, J. N., Vice-President and General Manager, Newport News & Old Point Railway & Electric Co., Hampton, Va.

Shroyer, Walter, Auditor, Union Traction Company of Indiana, Anderson, Ind.

Smith, R. P., Superintendent, Frederick Railroad Co., Frederick, Md.

Stanley, J. J., President, The Cleveland Railway Co., Cleveland, Ohio.

Steuart, W. M., Chief Statistician for Manufacturers, Bureau of Census, Washington, D. C.

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Stevens, R. P., President and General Manager, Lehigh Valley Transit Co., Allentown, Pa.

Sullivan, J. V., General Supervisor, Chicago Railways Co., Chicago, Ill.

Swift, H. S., Secretary and Auditor, Toledo Railways & Light Co., Toledo, Ohio.

Tichenor, Wm., Claim Agent, Terre Haute, Indianapolis & Eastern Traction Co., Indianapolis, Ind.

Townley, Calvert, President, Lackawanna & Wyoming Valley Railroad Co., New York, N. Y.

Waldron, J. M., Signal Engineer, Interborough Rapid Transit Co., New York, N. Y.

Walsh, E. P., Attorney, United Railways Co. of St. Louis, St. Louis, Mo.

Wells, C. B., Superintendent Transportation, The Denver City Tramway Co., Denver, Colo.

Wood, F. T., Assistant to General Manager, New York Railways Co., New York, N. Y.

Young, P. S., Comptroller, Public Service Railway Co., Newark, N. J.

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CONSTITUTION AND BY-LAWS

OF THE

AMERICAN ELECTRIC RAILWAY TRANSPORTATION AND TRAFFIC ASSOCIATION

CONSTITUTION

Name

I. The name of this Association shall be the "American Electric Railway Transportation and Traffic Association," and its office shall be at the place where the secretary resides.

Objects

II. The objects of this Association shall be to bring together general managers, managers, superintendents, passenger, express and freight agents, advertising managers, and other operating officials and employes engaged in or connected with the actual operation of urban and interurban railway companies and the electrified sections of steam railways for the interchange of ideas, consideration of operating and transportation problems, methods of promoting traffic, and all other matters incident thereto.

Members

III. The membership of this Association shall consist of two classes, as follows:

(a) Active members, consisting of active members of the American Electric Railway Association. Each active member shall be entitled to one vote on all questions coming before this Association, which shall be cast by a properly accredited representative of its transportation or traffic department. Each active member shall send as many delegates from these departments as it may desire.

(b) Associate members, consisting of associate members, of the American Electric Railway Association, who may elect to ally themselves with this Association.

Amendment

IV. This constitution may be amended by a two-thirds vote of the members present at a regular meeting, provided the proposed amendment shall have the approval of two-thirds of the executive committee, and provided also that a copy shall have been sent to each of the active members, at least thirty days prior to the date of the meeting at which the proposed amendment is to be acted upon.

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BY-LAWS

Officers and Executive Committee

I. The officers shall consist of a president, three vice-presidents, a secretary and treasurer, and four others, who shall constitute the executive committee. The executive committee shall have the entire charge and management of the affairs of the Association. The secretary and treasurer shall be the secretary and treasurer of the American Electric Railway Association. All other officers and members of the executive committee shall be elected by ballot at each annual meeting of the Association, and shall hold office until their successors shall be elected. The officers and members of the executive committee of this Association, with the exception of the secretary and treasurer, shall be chosen from the transportation and traffic departments of active members.

Duties of Officers

II. The officers of the association shall assume their duties immediately after the close of the meeting at which they are elected. They shall hold meetings at the call of the president, or, in his absence, at the call of the vice-presidents, in their order, and make arrangements for carrying out the objects of the Association. In case of resignation or death of an officer or a member of the executive committee, the vacancy may be filled for the unexpired term by the executive committee.

President

III. The president shall be the chief executive officer of the Association. The president, if present, or in his absence, one of the vice-presidents in their order, if present, shall preside at all meetings of the Association, and of the executive committee, and shall represent this Association on the executive committee of the American Electric Railway Association.

Secretary and Treasurer

IV. The duties of the secretary and treasurer shall be as follows:

(a) To receive and safely keep all moneys of the Association; to keep correct accounts of the same, and to pay all bills of the Association approved by the president.

He shall make an annual report, to be submitted to the Association at its annual convention. His bond given to the American Electric Railway Association shall be and is deemed to be sufficient for all the purposes of this Association.

His salary shall be fixed and paid by the American Electric Railway Association.

(b) To take minutes of all the proceedings of the Association and of the executive committee, and to enter them in books kept for that purpose.

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(c) To conduct the correspondence of the Association.

(d) To read minutes and notices at all meetings, and to present papers and communications, if the authors wish it.

(e) To collect and file for the benefit of the members information regarding matters relating to the purposes of the Association.

(f) To attend to the publication of the proceedings of this Association in connection with the secretary of the American Electric Railway Association.

(g) To send notices to all members of the Association at least thirty days before each meeting, mentioning papers to be read, and any special business to be brought before the meeting.

(h) To perform such other duties as may be required of him by the constitution and by-laws, and such duties as may be assigned him by the executive committee.

Executive Committee

V. (a) The executive committee shall hold a regular meeting before each regular annual meeting of the Association, and shall hold such special meetings as may be necessary. Such special meetings may be called by the president, or any five members of the executive committee. A majority of the members of the executive committee shall constitute a quorum at all meetings. A vote of the executive committee may be taken by mail when deemed necessary by the president.

(b) The secretary shall give such reasonable notice of all meetings as the committee shall by vote prescribe, and all such notices shall, as far as practicable, specify the business to be brought to the attention of the committee at such meetings.

(c) The executive committee shall present a report to each regular annual meeting of the Association, and shall include in such report the names of the members elected during the year, and its recommendations for the future work of the Association.

Meetings

VI. The regular annual meeting of this Association shall convene at a time and place to be approved by the executive committee. Special meetings may be held upon the order of the executive committee. Notice of every meeting shall be given by the secretary in a circular addressed to the members at least thirty days before the time of meeting. Fifteen members shall constitute a quorum at any meeting.

Order of Business

VII. At the regular meeting of the Association the order of business shall be:

1. Reading of the minutes of last meeting.
2. Report of the executive committee.
3. Address of the president.

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4. Report of the secretary and treasurer.
5. Reports of standing committees.
6. Reports of special committees.
7. Reading and discussion of papers.
8. General business.
9. Election of officers.

At the general meetings of the Association the order of business shall be the same, except as to the 2nd, 4th and 9th clauses.

Voting

VIII. All votes, except as herein otherwise provided, shall be *viva voce*, or by ballot upon the request of any member, and in the case of a tie, the presiding officer shall vote.

Reading of Papers

IX. All papers read at the meetings of the Association must relate to matters connected with the objects of the Association, and must have the approval of the executive committee before being read. Persons to whom subjects are assigned, must signify in writing their intention to prepare the paper, and forward it to the secretary at least sixty days previous to the date of the meeting.

Papers, Illustrations and Models

X. All papers, illustrations and models submitted to the meeting of the Association shall remain the property of the owners; subject however to retention by the executive committee for examination and use, but at the owner's risk.

Rules of Order

XI. All rules not provided for in these by-laws shall be those found in "Roberts' Rules of Order."

Amendment

XII. Notice of all propositions for adding to or altering any of these by-laws shall be given to the members of the Association, at least thirty days before the meeting at which they are to be acted upon.

Copy of Constitution and By-Laws

XIII. Each member of the Association shall be furnished by the secretary with a copy of the constitution and by-laws of the Association and also a list of the members.

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MEMBER COMPANIES AND THEIR TRANSPORTATION DEPARTMENT OFFICERS

(Arranged Alphabetically According to the Names of Companies.)

ALABAMA CITY, GADSDEN & ATTALLA RAILWAY CO., Gadsden, Ala.
Superintendent, Electrical Engineer and Park Manager, C. J. Zell.

ALBANY SOUTHERN RAILROAD CO., Albany, N. Y.
General Freight and Passenger Agent, C. E. Holmes; Superintendent Railroad, N. H. Brown; Park Manager, Fred Burger.

ALGIERS RAILWAY & LIGHTING CO., New Orleans, La.
General Manager, C. E. A. Carr; General Superintendent, C. W. Ford.

ALLEN STREET RAILWAY CO., Nazareth, Pa.
General Manager, Purchasing Agent and Chief Engineer, N. K. Putnam.

ALTOONA & LOGAN VALLEY ELECTRIC RAILWAY CO., Altoona, Pa.
Superintendent of Transportation L. T. Shannon.

ANNISTON ELECTRIC & GAS CO., Anniston, Ala.
General and Park Manager, R. L. Rand.

APPALACHIAN POWER CO., Bluefield, W. Va.
General Manager, H. W. Fuller.

ARKANSAS VALLEY INTERURBAN RAILWAY CO., Wichita, Kan.
Superintendent, Purchasing Agent and Chief Engineer, Charles D. Bell.

THE ARKANSAS VALLEY RAILWAY, LIGHT & POWER CO., Pueblo, Colo.
Superintendent of Transportation, W. C. Porter.

AROOSTOOK VALLEY RAILROAD CO., Presque Isle, Me.
Superintendent, M. S. W. Dingwall.

ASHEVILLE & EAST TENNESSEE RAILROAD, Asheville, N. C.
Vice-President and General Manager, Stanley Howard.

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ASHEVILLE POWER & LIGHT CO., Asheville, N. C.
Vice-President and General Manager, H. W. Plummer; Superintendent of Transportation, E. P. White.

ATHENS RAILWAY & ELECTRIC CO., Athens, Ga.
General Superintendent, C. L. Proctor.

ATLANTA-MACON RAILWAY COMPANY, Atlanta, Ga.
President, Kennett Cowan.

ATLANTIC COAST ELECTRIC RAILROAD CO., Asbury Park, N. J.
Superintendent, C. E. Hereth.

ATLANTIC SHORE RAILWAY, Kennebunk, Me.
General Manager and Purchasing Agent, L. H. McCray.

AUGUSTA-AIKEN RAILWAY & ELECTRIC CORPORATION, Augusta, Ga.
Superintendent Transportation, R. W. Spofford.

AURORA, ELGIN & CHICAGO RAILROAD CO., Wheaton, Ill.
Second Vice-President and General Manager, Edwin C. Faber, General Superintendent, B. E. Merwin; Superintendent of Transportation, Charles J. Jones.

AUSTIN STREET RAILWAY COMPANY, Austin, Tex.
President, W. J. Jones.

THE BALTIMORE & BEL-AIR ELECTRIC RAILWAY CO., Bel-Air, Md.
General Manager and Purchasing Agent, J. Alexis Shriver.

BANGOR RAILWAY & ELECTRIC CO., Bangor, Me.
Superintendent of Railway, C. H. Johnson.

BARTLESVILLE INTER-URBAN RAILWAY CO., Bartlesville, Okla.
General Manager, L. G. Coleman.

BATON ROUGE ELECTRIC CO., Baton Rouge, La.
Auditors and General Managers, Stone & Webster Management Association; Local Manager and Claim Agent, Wm. A. Buttrick; Superintendent, R. A. Delaroderie.

BAY STREET RAILWAY CO., Boston, Mass.
Vice-President and General Manager, Robert S. Goff; Assistant General Manager, H. E. Reynolds; Passenger Agent, R. M. Sparks; Superintendents, G. H. Gray, Thomas Lees, J. T. Conway, George F. Seibel; Superintendent of Time-table Department, A. S. Richey; General Express Agent, George Dumford.

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BEAUMONT TRACTION CO., Beaumont, Tex.
Receiver, J. F. Weed; General Manager, C. H. Kretz.

BENTON HARBOR-ST. JOE RAILWAY & LIGHT CO., Benton Harbor, Mich.
General Manager, H. C. Mason.

BINGHAMTON RAILWAY CO., Binghamton, N. Y.
General Manager, Auditor and Claim Agent, J. P. E. Clark.

BIRMINGHAM RAILWAY LIGHT & POWER CO., Birmingham, Ala.
President and General Manager, A. H. Ford; Superintendent of Railway Department George H. Harris.

BOSTON & WORCESTER STREET RAILWAY CO., Boston, Mass.
General Manager and Purchasing Agent, E. P. Shaw, Jr.; General Express Agent, F. C. Lewis.

BOSTON ELEVATED RAILWAY CO., Boston, Mass.
Superintendent of Transportation, Geo. R. Tripp; Assistant to Superintendent of Transportation, Edw. Dana; Superintendent of Inspection, C. E. Learned; Time-table Clerk, Timothy Connell.

BRIDGETON & MILLVILLE TRACTION CO., Bridgeton, N .J.
General Manager, B. Frank Hires.

BRITISH COLUMBIA ELECTRIC RAILWAY CO., LTD., Vancouver, B. C.
General Manager, R. H. Sperling; Manager of Interurban Lines, Allan Purvis, New Westminster, B. C.

BROCTON & PLYMOUTH STREET RAILWAY CO., Plymouth, Mass.
Resident Manager, Howard F. Eaton.

BROOKLYN HEIGHTS RAILROAD CO., THE, Brooklyn, N. Y.
Vice-President and General Manager, J. F. Calderwood; Superintendent Surface Lines, Wm. Siebert; Chief of Time-table Department, J. Weigel.

BUCKS COUNTY ELECTRIC RAILWAY CO., Newtown, Pa.
Vice-President and General Manager, W. H. Janney.

BUFFALO & LAKE ERIE TRACTION CO., Buffalo, N. Y.
Vice-President and General Manager, J. S. Pevear; Assistant General Manager and Engineer, A. R. Myers.

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BURLINGTON COUNTY TRANSIT COMPANY, Hainesport, N. J.
Superintendent, John M. Smith.

BUTTE ELECTRIC RAILWAY CO., Butte, Mont.
Vice-President and General Manager, Jesse R. Wharton; General Superintendent, J. S. Wathey.

CAPE BRETON ELECTRIC CO., LTD., Sydney, N. S.
General Managers, Stone & Webster Management Association; Manager, Earle L. Milliken; Railway Superintendent, J. B. Bulley.

CAPITAL TRACTION CO. (THE), Washington, D. C.
Second Vice-President and General Manager, D. S. Carll.

CARBON TRANSIT CO., Mauch Chunk, Pa.
Secretary and General Manager, J. F. Geiser.

CEDAR RAPIDS & IOWA CITY RAILWAY & LIGHT CO., Cedar Rapids, Ia.
President and General Manager, Wm. G. Dows; Traffic Manager, Isaac B. Smith; Superintendent, J. D. Warde; Assistant Superintendent, Chas. Munson.

CEDAR RAPIDS & MARION CITY RAILWAY CO., Cedar Rapids, Ia.
Superintendent, F. L. Diserens.

CENTRAL CALIFORNIA TRACTION CO., San Francisco, Cal.
General Manager and Secretary, H. A. Mitchell.

CENTRAL ILLINOIS PUBLIC SERVICE CO., Mattoon, Ill.
General Superintendent, G. W. Hamilton; Superintendent of Transportation, W. M. Brown.

CENTRAL PENNSYLVANIA TRACTION CO., Harrisburg, Pa.
Superintendent Transportation and Park Manager, F. M. Davis.

CHARLESTON CONSOLIDATED RAILWAY AND LIGHTING CO., Charleston, S. C.
Vice-President and General Manager, Geo. H. Waring; Superintendent of Railway Division, T. W. Passailaigue.

CHARLOTTE ELECTRIC RAILWAY CO., Charlotte, N. C.
Superintendent, R. L. Wommack.

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CHATTANOOGA RAILWAY & LIGHT CO., Chattanooga, Tenn.
General Manager, W. E. Boileau; Superintendent Railway Department, J. R. Anderson.

CHICAGO, AURORA & DE KALB R. R. CO., Aurora, Ill.
General Manager, J. H. Bliss, Jr.

CHICAGO CITY RAILWAY CO., Chicago, Ill.
Superintendent of Transportation, W. M. Weatherwax.

CHICAGO & INTERURBAN TRACTION CO., Chicago, Ill.
President, John L. Matson.

CHICAGO & JOLIET ELECTRIC RAILWAY CO., Joliet, Ill.
General Manager, J. R. Blackhall; Superintendent of Transportation and Claim Agent, W. H. Huen.

CHICAGO, LAKE SHORE & SOUTH BEND RAILWAY CO. (THE), Michigan City, Ind.
General Manager, C. N. Wilcoxon; Traffic Manager, W. O. Woodard; Superintendent, J. K. Gray.

CHICAGO RAILWAY CO., Chicago, Ill.
Vice-President and General Manager, Williston Fish; General Supervisor, Jos. V. Sullivan; Assistant Superintendent Transportation, Benj. Phillips; Superintendent Inspectors, J. H. Larkin; Superintendent Employment Train Service, Wm. Halkett; Superintendent Timetables, W. C. Pearce.

CHICAGO, SOUTH BEND & NORTHERN INDIANA RAILWAY CO., South Bend, Ind.
General Manager, C. D. Emmons; Superintendent of Transportation, F. I. Hardy.

CHILLICOTHE ELECTRIC RAILROAD, LIGHT & POWER CO., Chillicothe, O.
President and General Manager, George A. Vaughters; Assistant Manager, F. K. Sexauer.

CHIPPEWA VALLEY RAILWAY, LIGHT & POWER CO., Eau Claire, Wis.
Secretary, General Manager and Purchasing Agent, George B. Wheeler; Assistant Manager, A. E. Pierce; Superintendent, H. G. Lawrence.

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CINCINNATI, LAWRENCEBURG & AURORA ELECTRIC STREET RAILROAD CO., Cincinnati, O.
Treasurer and General Manager, C. E. Hooven.

CINCINNATI TRACTION CO. (THE), Cincinnati, O.
Vice-President and General Manager, Dana Stevens; Assistant General Manager, Thos. Fitzgerald; General Superintendent, R. E. Lee.

CITIZENS' TRACTION COMPANY (THE), Oil City, Pa.
General Manager, F. D. Shaffer.

CLEVELAND, PAINESVILLE & EASTERN RAILROAD CO., Willoughby, O.
Second Vice-President and General Manager, J. Jordan; Superintendent Transportation, J. C. Espy.

CLEVELAND RAILWAY CO. (THE), Cleveland, O.
General Manager, Geo. L. Radcliffe; General Superintendent, A. E. Duty.

CLEVELAND, SOUTHWESTERN & COLUMBUS RAILWAY CO., Cleveland, O.
Secretary, Claim Agent and General Manager, E. F. Schneider; General Passenger Agent, J. O. Wilson.

CLINTON STREET RAILWAY CO., Clinton, Ia.
Superintendent and Purchasing Agent, B. Bohnson.

COLORADO SPRINGS & INTERURBAN RAILWAY CO., Colorado Springs, Colo.
Superintendent and Purchasing Agent, B. M. Lathrop; Assistant Superintendent and Claim Agent, J. O. Henry.

COLUMBIA RAILWAY, GAS & ELECTRIC CO., Columbia, S. C.
General Manager, Guy K. Dustin; Superintendent, Alfred Wallace.

COLUMBUS RAILROAD CO., Columbus, Ga.
General Managers, Stone & Webster Management Association; Manager, John S. Bleecker.

COLUMBUS RAILWAY & LIGHT CO., Columbus, O.
First Vice-President, Treasurer and General Manager, Edward K. Stewart; Assistant General Superintendent, C. C. Collins; Superintendent Transportation, George Whisner.

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CONCORD, MAYNARD & HUDSON STREET RAILWAY CO., Maynard, Mass.
Superintendent, John A. Taggart; Assistant Superintendent, F. A. Persons.

CONESTOGA TRACTION CO., Lancaster, Pa.
General Manager, C. Edgar Titzel; Superintendent Transportation, Samuel Charles.

CONEY ISLAND & BROOKLYN RAILROAD CO., Brooklyn, N. Y.
President and General Manager, S. W. Huff; Superintendent of Transportation, W. E. Thompson.

CONNECTICUT COMPANY (THE), New Haven, Conn.
General Manager, J. K. Punderford; General Freight and Passenger Agent, M. J. Leary.

COUNTY TRACTION CO., Chicago, Ill.
General Manager and Secretary-Treasurer, Ed. J. Werner; General Superintendent, F. C. Chambers.

CUMBERLAND & WESTERNPORT ELECTRIC RY. CO., Cumberland, Md.
Secretary, Treasurer, Purchasing Agent and Park Manager, D. P. Hartzell; Superintendent, J. E. Taylor.

DALLAS CONSOLIDATED ELECTRIC STREET RAILWAY CO., Dallas, Tex.
Secretary, Treasurer and Manager, Edward T. Moore; General Superintendent, Richard Meriwether.

DANBURY & BETHEL STREET RAILWAY CO., Danbury, Conn.
General Manager and Claim Agent, John Sanders; Superintendent, G. H. Klinzing.

DANVILLE TRACTION & POWER CO., Danville, Va.
Superintendent and Purchasing Agent, N. W. Berkley.

DAYTON, COVINGTON & PIQUA TRACTION CO., West Milton, O.
Vice-President and General Manager, T. T. Robinson; General Superintendent, Thomas J. Brennan; General Freight and Passenger Agent, J. A. Randall.

DAYTON, SPRINGFIELD & XENIA SOUTHERN RAILWAY CO. (THE), Dayton, O.
Vice-President and General Manager, T. A. Ferneding.

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DAYTON & TROY ELECTRIC RAILWAY CO. (THE), Tippecanoe City, O.

Treasurer and General Manager, R. A. Crume; General Passenger and Freight Agent, O. H. Murlin; Superintendent, W. M. Kessler.

DENVER CITY TRAMWAY CO. (THE), Denver, Colo.

Second Vice-President and General Manager, John A. Beeler; Superintendent Transportation, C. B. Wells; Trainmaster, W. M. Casey; Division Superintendents, G. L. Rice, W. H. Seip, C. C. Port, J. L. Adams; Publicity Agent, Robert E. Harvey.

DES MOINES CITY RAILWAY CO., Des Moines, Ia.

Treasurer and General Manager, C. F. Hewitt; Superintendent of Transportation, L. L. Sloss.

DETROIT UNITED RAILWAY, Detroit, Mich.

General Manager, F. W. Brooks; General Superintendent Harry Bullen; General Express and Freight Agent, G. W. Parker; General Passenger Agent, John F. Keys.

DOUGLAS TRACTION & LIGHT CO., Douglas, Ariz.

General Manager and Superintendent, R. G. Arthur.

DULUTH STREET RAILWAY CO. (THE), Duluth, Minn.

General Manager, Herbert Warren.

EASTERN PENNSYLVANIA RAILWAYS CO., Pottsville, Pa.

Manager, W. B. Rockwell; Superintendent of Railways, C. F. Crane.

EAST ST. LOUIS & SUBURBAN RAILWAY CO., East St. Louis, Ill.

General Superintendent and Purchasing Agent, A. J. Purinton; Superintendent Freight Traffic, C. S. Darrach.

EASTON TRANSIT CO., Easton, Pa.

President and General Manager, H. R. Fehr; Superintendent, H. H. Patterson.

EASTERN WISCONSIN RAILWAY & LIGHT COMPANY, Fond du Lac, Wis.

General Manager, J. P. Pulliam.

ELGIN & BELVIDERE ELECTRIC CO., Chicago, Ill.

General Manager, E. E. Downs; Assistant to the General Manager, W. P. Hendricks.

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ELMIRA WATER, LIGHT & RAILROAD CO., Elmira, N. Y.
General Manager, H. M. Beardsley; Superintendent Railroad Department, F. G. Maloney.

EL PASO ELECTRIC RAILWAY CO., El Paso, Texas.
Manager, C. W. Kellogg, Jr.; General Managers, Stone & Webster Management Association; General Superintendent, H. S. Potter.

ENID CITY RAILWAY CO., Enid, Okla.
President and General Manager, C. H. Bosler; Superintendent, Park Manager, Purchasing Agent and Claim Agent, C. Kline.

ESCANABA TRACTION CO., Escanaba, Mich.
General Manager, Superintendent and Purchasing Agent, P. L. Utley.

EVANSVILLE RAILWAYS CO., Evansville, Ind.
General Manager, W. A. Carson; Superintendent Transportation, E. L. Moore; General Freight and Passenger Agent, D. C. Powell.

EVERETT RAILWAY, LIGHT & WATER CO., Everett, Wash.
General Managers, Stone & Webster Management Association; Manager, D. C. Barnes.

EXETER, HAMPTON & AMESBURY STREET RAILWAY, Hampton, N. H.
Manager, J. A. MacAdams.

FARGO & MOORHEAD STREET RAILWAY CO., Fargo, N. D.
Managers and Engineers, H. M. Byllesby & Co., Chicago, Ill.; General Superintendent and Purchasing Agent, C. P. Brown.

FISHKILL ELECTRIC RAILWAY CO., Fishkill-on-the-Hudson, N. Y.
President and Manager, J. T. Smith.

FITCHBURG & LEOMINSTER STREET RAILWAY CO., Fitchburg, Mass.
President and General Manager, W. W. Sargent.

FONDA, JOHNSTOWN & GLOVERSVILLE RAILROAD CO., Gloversville, N. Y.
General Manager, W. H. Collins; Division Superintendent, Cayadutta Division, C. Banker; Division Superintendent, Amsterdam Division, J. G. Nellis; General Passenger Agent, R. M. Colt.

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FORT SMITH LIGHT & TRACTION CO., Fort Smith, Ark.
General Manager, J. Walter Gillette; Superintendent Transportation, Paul O. McCarthy.

FORT WAYNE & NORTHERN INDIANA TRACTION CO., Fort Wayne, Ind.
Assistant General Manager, Sam. W. Greenland; Superintendent Transportation, C. E. Palmer.

FORT WAYNE & SPRINGFIELD RAILWAY CO. (THE), Decatur, Ind.
General Manager, W. H. Fledderjohann.

FREDERICK RAILROAD CO., Frederick, Md.
Superintendent and Purchasing Agent, R. Paul Smith; General Manager, Franz von Schilling.

FREEPORT RAILWAY & LIGHT CO., Freeport, Ill.
President, General Manager and Purchasing Agent, A. J. Goddard.

FRESNO TRACTION CO., Fresno, Cal.
Vice-President and General Manager, F. W. Webster; Superintendent, T. A. Cashin.

FRIES MANUFACTURING & POWER CO. (THE), Winston-Salem, N. C.
General Manager, Park Manager, Purchasing Agent and Electrical Engineer, J. J. Sigg.

GALESBURG & KEWANEE ELECTRIC RAILWAY CO., Kewanee, Ill.
General Manager and Purchasing Agent, R. H. Hayward.

GALVESTON ELECTRIC CO., Galveston, Tex.
General Managers, Stone & Webster Management Association; Manager, L. C. Bradley; Superintendent Transportation, Chas. S. McLin.

GARDNER, WESTMINSTER & FITCHBURG STREET RAILWAY CO., Gardner, Mass.
Manager, Purchasing Agent and Superintendent, C. A. Jefts.

GEORGIA RAILWAY & POWER CO., Atlanta, Ga.
Vice-President and General Manager, G. W. Brine; Superintendent Transportation, S. E. Simmons; Assistant Superintendent Transportation, O. H. Matthews.

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GENEVA & AUBURN RAILWAY CO., Seneca Falls, N. Y.
Vice-President and General Manager, W. B. Atwood.

GRAND FORKS STREET RAILWAY CO., Grand Forks, N. D.
General Manager, Thomas Roycraft.

GRAND JUNCTION & GRAND RIVER VALLEY RAILWAY CO. (THE), Grand Junction, Colo.
Vice-President and General Manager, E. A. Sunderlin; General Superintendent, S. M. L. McSpadden.

GRAND RAPIDS, GRAND HAVEN & MUSKEGON RY. CO., Grand Rapids, Mich.
Second Vice-President and General Manager, W. K. Morley; Traffic Manager and Claim Agent, S. L. Vaughan.

GRAND RAPIDS RAILWAY CO., Grand Rapids, Mich.
President and General Manager, Benj. S. Hanchett; Superintendent, J. C. Madigan.

GRANITE CITY RAILWAY CO., St. Cloud, Minn.
Secretary, Treasurer, General Manager and Purchasing Agent, E. E. Clark.

GRAY'S HARBOR RAILWAY & LIGHT CO., Aberdeen, Wash.
Secretary and General Manager, H. B. Zimmerman.

GREAT FALLS ELECTRIC PROPERTIES — STREET RAILWAY BRANCH, Great Falls, Mont.
General Manager, Max Hebgen; Local Manager, E. I. Holland; Superintendent Transportation, L. M. McAllister.

HALIFAX ELECTRIC TRAMWAY CO., LTD., Halifax, N. S.
Manager, J. W. Crosby; General Superintendent and Chief Engineer, P. A. Freeman.

HANOVER & MCSHERRYSTOWN STREET RAILWAY CO., Hanover, Pa.
General Manager, R. E. Manley.

HARTFORD & SPRINGFIELD STREET RAILWAY CO., Warehouse-point, Conn.
General Manager, Purchasing Agent and Claim Agent, Ray W. Reynolds.

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HATTIESBURG TRACTION CO., Hattiesburg, Miss.
General Manager and Purchasing Agent, C. Z. Stevens; Superintendent, W. H. Sparrow.

HELENA LIGHT & RAILWAY CO., Helena, Mont.
General Superintendent, W. C. Sharp; Superintendent of Railway, A. H. Church.

HOLYOKE STREET RAILWAY CO., Holyoke, Mass.
General Manager, L. D. Pellissier; General Superintendent, G. H. Hunter.

HONOLULU RAPID TRANSIT & LAND CO., Honolulu, Hawaii.
General Manager, Purchasing and Claim Agent, C. G. Ballentyne; Superintendent Transportation, Alex. Pratt.

HORNELL TRACTION CO., Hornell, N. Y.
General Manager, D. A. Proctor; Superintendent, D. J. Haren.

HOT SPRINGS STREET RAILWAY, Hot Springs, Ark.
Vice-President and Managing Director, Judson H. Boughton; General Manager, S. E. Dillon; Superintendent, J. H. Butterfield; Park Manager, Geo. W. Owens.

HOUGHTON COUNTY TRACTION CO., Houghton, Mich.
General Managers, Stone & Webster Management Association; Manager, Gardner Rogers; Superintendent, John Ralph, Jr.

HOUSTON ELECTRIC CO., Houston, Tex.
General Managers, Stone & Webster Management Association; Assistant Secretary and Manager, David Daly; General Superintendent, R. T. Sullivan.

HUDSON & MANHATTAN RAILROAD CO., New York, N. Y.
Vice-President and General Manager, Wilbur C. Fisk; General Superintendent, E. T. Munger; Superintendent of Transportation, J. F. O'Rourke.

HUDSON VALLEY RAILWAY CO., Glens Falls, N. Y.
General Manager, A. E. Reynolds; General Freight Agent, F. F. Newberry; Division Superintendents, D. H. Hall and John Mahoney; Traffic Manager, C. H. Armatage.

HUNTINGTON RAILROAD CO., Huntington, N. Y.
General Manager, J. A. McCrea; General Superintendent, H. W. Thornton; Superintendent, J. P. Kineon.

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HUTCHINSON INTERURBAN RAILWAY CO. (THE), Hutchinson, Kan.

General Manager, W. A. Scothorn; Park Managers, K. C. Beck and N. P. Stevens.

ILLINOIS TRACTION SYSTEM, Decatur, Ill.

General Superintendent, C. F. Handshy; Traffic Manager, G. W. Quackenbush.

INDIANAPOLIS & CINCINNATI TRACTION CO., Indianapolis, Ind.

President and General Manager, Chas. L. Henry; Superintendent, Oscar Lively.

INDIANAPOLIS, COLUMBUS & SOUTHERN TRACTION CO., Columbus, Ind.

General Manager and Purchasing Agent, Alexander Shane.

INDIANAPOLIS, CRAWFORDSVILLE & DANVILLE ELECTRIC RAILWAY COMPANY, Crawfordsville, Ind.

General Manager and Purchasing Agent, J. N. Spellman; Superintendent and Roadmaster, E. A. Turpin; General Freight and Passenger Agent, Stephen R. Ridlen.

INDIANAPOLIS TRACTION & TERMINAL CO., Indianapolis, Ind.

President and General Manager, Robert I. Todd; Superintendent, John J. Mahoney.

INTERBOROUGH RAPID TRANSIT CO., New York, N. Y.

Vice-President and General Manager, Frank Hedley; Assistant to Vice-President and General Manager, George Keegan.

INTERURBAN RAILWAY CO. (THE), Helena, Ark.

Superintendent, R. L. Hope, Jr.

INTER-URBAN RAILWAY COMPANY, Des Moines, Ia.

Treasurer and General Manager, C. F. Hewitt; Superintendent of Transportation, G. I. Gadsby; General Barn Foreman, Chas. Sprague.

INTERURBAN RAILWAY & TERMINAL CO. (THE), Cincinnati, O.

President and General Manager, Charles H. Davis; Superintendent, Purchasing Agent and Electrical Engineer, F. H. Talbot; Assistant Superintendent, A. Sharpsteen; General Freight Agent, S. S. Morris.

IOWA AND ILLINOIS RAILWAY CO., Davenport, Ia.

General Manager, P. P. Crafts.

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IOWA CITY ELECTRIC RAILWAY CO., Iowa City, Ia.
President, General Manager and Purchasing Agent, J. O. Schulze.

ITHACA STREET RAILWAY CO., Ithaca, N. Y.
General Manager for Receivers, H. A. Clarke; Assistant General Manager, R. L. Post.

JACKSON LIGHT & TRACTION COMPANY, Jackson, Miss.
General Manager, R. H. Smith.

JACKSONVILLE TRACTION CO., Jacksonville, Fla.
General Managers, Stone & Webster; Manager, Hardy Croom; General Superintendent, C. V. Cosby.

JERSEY CENTRAL TRACTION CO., Keyport, N. J.
General Superintendent, A. H. Mann.

JOHNSON CITY TRACTION CORPORATION, Johnson City, Tenn.
Secretary, General Manager and Purchasing Agent, A. Smith, Jr.; Superintendent, Electrical Engineer and Roadmaster, G. C. Sanders.

JOPLIN & PITTSBURG RAILWAY CO., Pittsburg, Kan.
General Manager, W. A. Satterlee.

KANSAS CITY, CLAY COUNTY & ST. JOSEPH RY. CO., Kansas City, Mo.
General Manager, J. R. Harrigan; Superintendent Transportation, J. A. Weimer.

KANSAS CITY RAILWAY & LIGHT CO., Kansas City, Mo.
General Manager, L. H. Egan; General Superintendent, J. E. Gibson.

KANSAS CITY-WESTERN RAILWAY CO. (THE), Leavenworth, Kan.
General Superintendent, J. W. Richardson; Assistant Superintendent and Purchasing Agent, J. G. Herrin.

KENTUCKY TRACTION & TERMINAL CO., Lexington, Ky.
General Manager, I. L. Oppenheimer; General Freight Agent, J. D. Sallee; Superintendent of Transportation, Henry Bush.

KEOKUK ELECTRIC CO., Keokuk, Ia.
General Managers, Stone & Webster Management Association; Manager, A. D. Ayres.

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KEY WEST ELECTRIC CO. (THE), Key West, Fla.
General Managers, Stone & Webster Management Association; Manager, Donald Stewart; Superintendent, B. L. Grooms.

KINGSTON, PORTSMOUTH & CATARAQUI ELECTRIC RAILWAY CO., Kingston, Ont., Canada.
Superintendent and Purchasing Agent, H. C. Nickle; Park Manager, D. P. Branigan.

KNOXVILLE RAILWAY & LIGHT CO., Knoxville, Tenn.
President and General Manager, C. H. Harvey; Superintendent Railway Department, T. C. Kelly.

KOKOMO, MARION AND WESTERN TRACTION CO., Kokomo, Ind.
Secretary-Treasurer and General Manager, Thomas C. McReynolds; Assistant General Manager, P. H. Palmer; Superintendent Transportation, H. P. Martzolf; Chief Train Dispatcher, C. P. Ryan.

LACKAWANNA & WYOMING VALLEY RAILROAD CO., Scranton, Pa.
Vice-President, Secretary and General Manager, Chas. F. Conn; Assistant to General Manager, W. E. Higgins; Superintendent Transportation, J. H. Murray; Assistant General Freight and Passenger Agent, W. L. Cairns; Trainmaster, C. S. Colony.

LAKE SHORE ELECTRIC RAILWAY CO., Sandusky, O.
Vice-President and General Manager, F. W. Coen; Superintendent, L. K. Burge; General Passenger Agent, J. F. Starkey.

LAREDO ELECTRIC & RAILWAY CO. (THE), Laredo, Tex.
Secretary, General Manager and Claim Agent, Frank E. Scovill; Superintendent, J. B. Morton.

LA SALLE COUNTY ELECTRIC RAILROAD CO., Chicago, Ill.
General Superintendent, A. S. Dodge.

LAS VEGAS TRANSIT CO., Las Vegas, New Mex.
President, C. C. Chappelle.

LAWRENCE RAILWAY & LIGHT CO., Lawrence, Kan.
General Manager, J. T. Skinner.

LEHIGH VALLEY TRANSIT CO., Allentown, Pa.
President and General Manager, R. P. Stevens; Traffic Manager, C. C. Collins; Superintendent of Transportation, G. E. Miller.

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LEWISTOWN & REEDSVILLE ELECTRIC RAILWAY CO. (THE), Lewistown, Pa.

President, General Manager and Purchasing Agent, J. I. Quigley; Superintendent Transportation and Electrical Engineer, C. E. Gossard; Park Manager, F. R. Quigley.

LITTLE ROCK RAILWAY & ELECTRIC CO., Little Rock, Ark.

Treasurer and General Manager, C. J. Griffith; Superintendent Railway, R. Eick; Assistant Superintendent Railway, R. B. Grimmett.

LONDON AND LAKE ERIE RAILWAY & TRANSPORTATION CO. (THE), London, Ont.

President, H. R. George.

LOS ANGELES RAILWAY CORPORATION, Los Angeles, Cal.

Vice-President and General Manager, Howard Huntington; Assistant General Manager, Secretary and Treasurer, C. A. Henderson; Superintendent, John J. Akin.

LOUISVILLE & SOUTHERN INDIANA TRACTION CO., New Albany, Ind.

General Manager, M. J. Insull; Assistant to General Manager and Claim Agent, C. B. Scott; Superintendent, F. E. Cole.

LOUISVILLE RAILWAY CO., Louisville, Ky.

President and General Manager, T. J. Minary; Superintendent of Transportation, Samuel Riddle.

LYNCHBURG TRACTION & LIGHT CO., Lynchburg, Va.

President, General Manager and Purchasing Agent, R. D. Apperson; Superintendent Railway Department and Claim Agent, D. C. Frost.

MACON RAILWAY & LIGHT COMPANY, Macon, Ga.

General Manager, L. S. Boggs; Superintendent Transportation, T. H. Williamson.

MAHONING & SHENANGO RAILWAY & LIGHT CO., Youngstown, O.

General Superintendent of Railways, G. J. A. Paul.

MANCHESTER STREET RAILWAY, Manchester, N. H.

Assistant Treasurer and General Manager, J. Brodie Smith; Superintendent, T. H. Kendrigan; Assistant Superintendent, S. P. Hunt.

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MANILA ELECTRIC RAILROAD & LIGHT CO., Manila, P. I.
General Managers, J. G. White & Co., Inc.; General Manager, C. L. Stone.

MANITOWOC & NORTHERN TRACTION CO., Manitowoc, Wis.
President, Treasurer, Manager and Purchasing Agent, Thos. Higgins; Superintendent, James Phair.

MARQUETTE COUNTY GAS & ELECTRIC CO., Ishpeming, Mich.
Vice-President and General Manager, W. J. McCorkindale.

MARYLAND ELECTRIC RAILWAYS (THE), Annapolis, Md.
General Manager, Tallmadge C. Cherry; General Passenger and Freight Agent, A. S. Arnold.

MASON CITY & CLEAR LAKE RAILROAD CO., Mason City, Ia.
Secretary and General Manager, F. J. Hanlon.

MASSACHUSETTS NORTHEASTERN ELECTRIC RAILWAY CO., Haverhill, Mass.
General Manager, Franklin Woodman.

MAYSVILLE STREET RAILROAD & TRANSFER CO., Maysville, Ky.
Secretary, Treasurer and Manager, R. A. Cochran; Superintendent, Beecher Holliday.

MEMPHIS STREET RAILWAY CO. (THE), Memphis, Tenn.
President and General Manager, T. H. Tutwiler; General Superintendent, E. W. Ford; Superintendent Transportation, J. L. Foster.

MENOMINEE & MARINETTE LIGHT & TRACTION CO., Menominee, Mich.
Secretary and General Manager, Edward Daniell.

MERIDIAN LIGHT & RAILWAY CO., Meridian, Miss.
Second Vice-President and General Manager, A. B. Paterson; Superintendent Railway Department, I. H. McArthur.

METROPOLITAN WEST SIDE ELEVATED RAILWAY CO. (THE), Chicago, Ill.
General Manager, E. C. Noe; General Superintendent Transportation, M. J. Feron; Trainmaster, W. C. Kelly; Assistant General Manager, G. T. Seely.

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MEXICO TRAMWAYS CO., City of Mexico, Mex.
General Manager, Harro Harrsen; Superintendent of Traffic, Robert Grinnell.

MICHIGAN UNITED TRACTION COMPANY, Jackson, Mich.
Vice-President and General Manager, J. F. Collins; General Superintendent, C. E. Morgan; General Passenger Agent, F. W. Brown; Publicity Agent, E. E. Soules.

MIDDLESEX & BOSTON STREET RAILWAY CO., Newtonville, Mass.
General Manager, George M. Cox; Superintendent of First Division, Samuel E. Walker; Superintendent of Second Division, J. W. Sullivan; Superintendent of Fourth Division, F. P. Quackenbush; Superintendent of Fifth Division, W. S. Scamman.

MILFORD & UXBRIDGE STREET RAILWAY CO., Milford, Mass.
General Manager, Walter L. Adams.

MILLVILLE TRACTION CO., Millville, N. J.
Treasurer and General Manager, D. C. Lewis.

MILWAUKEE ELECTRIC RAILWAY & LIGHT CO. (THE), Milwaukee, Wis.
President and General Manager, J. D. Mortimer; Vice-President and Assistant General Manager in Charge of Railway Departments, R. B. Stearns; Superintendent Transportation, George Kuemmerlein, Jr.; Superintendent Interurban Division, A. J. Killa.

MILWAUKEE-WESTERN RAILWAY CO., Milwaukee, Wis.
General Manager, W. D. Chapman; Secretary and Assistant General Manager, J. W. Barber; General Superintendent, Finance and Construction, W. D. Chapman.

MINNEAPOLIS, ST. PAUL, ROCHESTER & DUBUQUE ELECTRIC TRACTION CO., Minneapolis, Minn.
General Manager, D. S. Smith; General Superintendent and Purchasing Agent, F. A. Martin; General Freight Agent, W. D. DeLong; Park Manager, W. P. Mason.

MISABA RAILWAY CO., Virginia, Minn.
General Manager, H. S. Newton.

MISSOULA STREET RAILWAY CO., Missoula, Mont.
Secretary-Treasurer and General Manager, S. R. Inch.

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MISSOURI & KANSAS INTERURBAN RAILWAY CO., Overland Park, Kan.
General Manager, Thomas Riley.

MOBILE LIGHT & RAILROAD CO., Mobile, Ala.
President and Manager, J. H. Wilson; Superintendent of Transportation, W. J. Sherwood.

MONONGAHELA VALLEY TRACTION COMPANY, Fairmont, West Va.
General Manager, J. O. Watson; General Superintendent, Smith Hood.

MONTEREY RAILWAY, LIGHT & POWER CO., Monterey, N. L., Mexico.
Vice-President and General Manager, Lewis Lukes; Assistant to the General Manager, A. R. Hill; Superintendent of Traffic, M. T. Montgomery.

MONTGOMERY TRACTION CO., Montgomery, Ala.
General Manager and Purchasing Agent, L. D. Mathes; Superintendent, W. J. Ginnivan; Superintendent Transportation and Claim Agent, C. B. Jones.

MONTREAL TRAMWAYS CO., Montreal, Que.
General Manager, J. E. Hutcheson; Superintendent, A. Gaboury.

MOOSE JAW ELECTRIC RY. CO. (THE), Moose Jaw, Sask., Canada.
General Superintendent, A. Hector Dion.

MORRIS COUNTY TRACTION CO., Morristown, N. J.
General Manager, Joseph K. Choate; Superintendent of Operation, Western Division, Geo. H. Ross, Jr.; Superintendent of Operation, Eastern Division, W. H. Swain.

MUNCIE & PORTLAND TRACTION CO. (THE), Portland, Ind.
General Manager and Purchasing Agent, E. B. Lincoln; Chief Dispatcher, H. C. Gehring.

MUSKEGON TRACTION & LIGHTING CO., Muskegon, Mich.
President and General Manager, J. T. Young.

MUSKOGEE ELECTRIC TRACTION CO., Muskogee, Okla.
Manager and Purchasing Agent, R. D. Long.

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NAHANT & LYNN STREET RAILWAY CO., Lynn, Mass.
General Manager and Electrical Engineer, Joseph E. Dozier.

NASHVILLE RAILWAY & LIGHT CO., Nashville, Tenn.
President and General Manager, Percy Warner; Superintendent Railway Department, H. A. Davis.

NEW ORLEANS RAILWAY & LIGHT CO., New Orleans, La.
President and General Manager, Hugh McCloskey; Manager Railway and Electrical Department, D. A. Hegarty; Superintendent of Transportation, H J. Dressel; Assistant Superintendent of Transportation, R. M. O'Brien; Superintendent of Railway, V. L. Willoz.

NEWPORT NEWS & OLD POINT RAILWAY & ELECTRIC CO., Hampton, Va.
Vice-President and General Manager, J. N. Shannahan.

NEW YORK & NORTH SHORE TRACTION CO. (THE), Roslyn, N. Y.
President and General Manager, George A. Stanley; General Superintendent, Ralph W. Emerson.

NEW YORK STATE RAILWAYS, Rochester, N. Y.
Superintendent of Transportation, City Lines, W. C. Callaghan; Superintendent of Transportation, Interurban Lines, M. D. Kilbride; General Passenger and Express Agent, B. E. Wilson.

NORFOLK & BRISTOL STREET RAILWAY CO., Foxboro, Mass.
General Manager, M. A. Cavanaugh; Superintendent, F. M. Perry; Park Manager, Thomas Ross.

NORTH CAROLINA PUBLIC SERVICE CO. (THE), Greensboro, N. C.
Vice-President and General Manager, J. P. Clark; Manager and Purchasing Agent, C. H. Andrews; Superintendent of Railway, W. L. Frazier; Superintendent of High Point, J. H. Jennings.

NORTHAMPTON STREET RAILWAY CO., Northampton, Mass.
Treasurer, Secretary and General Manager, Louis D. Pellissier; Superintendent, Edwin C. Clark.

NORTHAMPTON TRACTION CO., Easton, Pa.
General Manager, W. O. Hay.

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NORTH JERSEY RAPID TRANSIT CO., Paterson, N. J.
Acting Vice-President and General Manager, Willis E. Fertig; Superintendent, Chief Engineer, Geo. J. Jackson, Jr.

NORTHERN CAMBRIA STREET RAILWAY CO., Patton, Pa.
Superintendent and Park Manager, J. L. McNelis.

NORTHERN ELECTRIC RAILWAY CO., San Francisco, Cal.
General Manager, A. D. Schindler; Superintendent, J. B. Rowray; General Freight and Passenger Agent, S. W. Russell.

NORTHERN ILLINOIS LIGHT & TRACTION CO., Ottawa, Ill.
General Manager, H. E. Chubbuck; General Superintendent, L. W. Hess.

NORTHERN OHIO TRACTION & LIGHT CO., Akron, O.
Vice-President and General Manager, Chas. Currie; General Superintendent, W. H. Douglas.

NORTHERN TEXAS TRACTION CO., Fort Worth, Tex.
Vice-President and Manager, G. H. Clifford; Assistant Manager, W. C. Forbess; General Managers, Stone & Webster Management Association; Superintendent of Transportation, Fort Worth Division, C. H. Bowen.

NORTHWESTERN OHIO RAILWAY & POWER CO., Toledo, Ohio.
General Manager, E. A. Burrill; General Superintendent, O. R. Sturzinger.

NORTHWESTERN PENNSYLVANIA RAILWAY CO., Meadville, Pa.
General Manager, C. L. Murray.

OGDEN RAPID TRANSIT CO., Ogden, Utah.
Superintendent, Purchasing and Claim Agent, J. W. Bailey; Assistant Superintendent, J. M. Read.

OHIO & SOUTHERN TRACTION CO. (THE), Columbus, O.
Chief Engineer and General Manager, E. C. Schwab; General Superintendent, W. V. Baker.

OHIO ELECTRIC RAILWAY CO. (THE), General Office, Cincinnati, O.
General Manager, B. J. Jones; Assistant General Manager, A. Benham; Superintendents, F. J. Moore, G. D. Nicoll, H. G. Gilpin, B. M. Brown, C. C. Fast; General Passenger and Freight Agent, W. S. Whitney.

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OHIO RIVER ELECTRIC RAILWAY & POWER CO. (THE), Pomeroy, O.
General Superintendent, I. L. Oppenheimer; Superintendent, J. W. Wolfe.

OHIO VALLEY ELECTRIC RAILWAY CO., Huntington, W. Va.
General Manager, W. W. Magoon.

OKLAHOMA RAILWAY CO., Oklahoma City, Okla.
Second Vice-President and General Manager, Geo. W. Knox; Assistant General Manager, J. J. Johnson; Publicity Director, H. C. Martin.

OLYMPIA LIGHT & POWER CO., Olympia, Wash.
Treasurer, General Manager and Claim Agent, L. B. Faulkner; General Superintendent, H. C. Ranft.

OMAHA & COUNCIL BLUFFS STREET RAILWAY CO., Omaha, Neb.
Second Vice-President and General Manager, W. A. Smith; Assistant General Manager, R. A. Leussler.

OMAHA, LINCOLN & BEATRICE RAILWAY CO., Lincoln, Neb.
Secretary and Manager, H. S. Norton.

OREGON ELECTRIC RAILWAY CO., Portland, Ore.
General Manager, C. A. Coolidge; Superintendent, A. J. Davidson.

OTSEGO & HERKIMER RAILROAD CO., Hartwick, N. Y.
General Manager, S. W. Mower; Superintendent Transportation, C. O. Weidman; General Freight and Passenger Agent, J. W. Nugent.

OTTAWA ELECTRIC RAILWAY CO., Ottawa, Ont.
Superintendent, F. D. Burpee.

OTTUMWA RAILWAY & LIGHT CO., Ottumwa, Iowa.
Manager, C. E. Fahrney; Superintendent, F. Isaacson.

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PACIFIC ELECTRIC RAILWAY COMPANY, Los Angeles, Cal.

General Manager, J. McMillan; Traffic Manager, D. W. Pontius; Manager Outside Operation, C. H. Burnett; Superintendent Southern Division, W. T. Maddex; Superintendent Northern Division, J. C. McPherson; Superintendent San Antonio Division, F. L. Annable; Superintendent Western Division, W. C. White; Superintendent Riverside Division, M. P. Groftholdt; Superintendent San Bernardino Division, A. B. Merrihew; Manager Personally Conducted Trolley Trips, W. H. Dempster; Traveling Passenger Agents, E. L. Taylor, B. L. Dowell, E. C. Thomas; Terminal Freight Agent, J. Bennett; Traveling Freight Agents, F. C. Weeks, O. A. Smith.

PACIFIC GAS & ELECTRIC CO., Sacramento, Division, Sacramento, Cal.

District Manager, C. W. McKillip; General Superintendent Railway, N. J. Hullin.

PADUCAH TRACTION CO. (THE), Paducah, Ky.

General Managers, Stone & Webster Management Association; Manager, H. B. Sewall; Superintendent, J. W. McNeely.

PANAMA TRAMWAYS CO., Panama, C. Z.

President, Geo. J. Dundon.

PARIS TRANSIT COMPANY, Paris, Tex.

Manager, John A. Porter; General Superintendent, W. B. Head; Superintendent, R. F. Grimes.

PARKERSBURG, MARIETTA & INTER-URBAN RAILWAY CO., Parkersburg, W. Va.

General Manager, Henry H. Archer.

PEEKSKILL LIGHTING & RAILROAD CO., Ossining, N. Y.

Vice-President, General Manager and Purchasing Agent, Stuart Wilder; Assistant General Manager, I. M. Beatty; Superintendent, H. W. Terry, Jr.

PENINSULAR RAILWAY CO., San José, Cal.

General Manager, F. E. Chapin; General Freight and Passenger Agent, E. G. Shoup.

PENNSYLVANIA RAILROAD CO. (THE), Philadelphia, Pa.

Vice-President in Charge of Traffic, Geo. D. Dixon; General Superintendent New Jersey Division and West Jersey & Seashore R. R., F. L. Sheppard, New York, N. Y.; Superintendent Manhattan Division, C. S. Krick.

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PENSACOLA ELECTRIC CO., Pensacola, Fla.
Manager, Alba H. Warren; Superintendent of Transportation, T. J. Hanlon, Jr.

PEOPLE'S GAS & ELECTRIC CO., Burlington, Iowa.
Secretary, Treasurer and General Manager, C. H. Walsh; Superintendent and Purchasing Agent, D. D. Bentzinger; Superintendent Transportation, Charles Birck.

PEOPLE'S RAILWAY CO. (THE), Dayton, O.
General Manager, George C. Towle; Superintendent of Transportation and Claim Agent, V. R. Powell.

PEORIA RAILWAY TERMINAL CO., Peoria, Ill.
General Manager, J. H. Franke.

PETERBOROUGH RADIAL RAILWAY CO. (THE), Peterborough, Ont.
Local Manager, W. H. Munro.

PHILADELPHIA & WEST CHESTER TRACTION CO., Philadelphia, Pa.
Superintendent Transportation, J. T. Brosius; General Freight Agent, C. DeBie, Jr.

PHILADELPHIA & WESTERN RAILWAY CO., Upper Darby, Pa.
Assistant to President, J. L. Adams (Charge of Operation); Trainmaster, C. S. Mountz; Roadmaster, Frank Curry.

PHILADELPHIA RAPID TRANSIT CO., Philadelphia, Pa.
Superintendent of Transportation, James Bricker; Superintendent Willow Grove Park, J. R. Davies.

PICTOU COUNTY ELECTRIC CO., LTD., New Glasgow, N. S.
President and General Manager, Chas. A. Flaherty; Superintendent, Purchasing Agent and Park Manager, Leonard T. Flaherty.

THE PINE BLUFF COMPANY, Pine Bluff, Ark.
Superintendent of Transportation, J. W. Adams.

PITTSBURGH & BUTLER STREET RAILWAY CO., Butler, Pa.
General Manager, E. C. Carpenter; Superintendent, H. Haman.

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PITTSBURGH RAILWAYS CO., Pittsburgh, Pa.
Second Vice-President, S. L. Tone; General Superintendent, P. N. Jones; Superintendent of Transportation, M. J. Maxwell.

POINT PLEASANT TRACTION COMPANY, Point Pleasant, N. J.
General Manager and Purchasing Agent, Thos. W. Haldeman; Park Manager, R. A. Clark.

PORTLAND RAILWAY, LIGHT & POWER CO., Portland, Ore.
General Manager, F. W. Hild; Traffic Manager, F. D. Hunt; General Superintendent Railway Department, C. J. Franklin.

PORTLAND, EUGENE & EASTERN RAILWAY CO., Portland, Ore.
General Manager, L. E. Moe; Superintendent, General Freight and Passenger Agent, H. G. Fleischhaur.

PORTLAND RAILROAD CO., Portland, Me.
Secretary, Treasurer, General Manager and Purchasing Agent, Chas. F. Berry; Park Manager, D. B. Smith.

PORTO RICO RAILWAY, LIGHT & POWER CO., San Juan, Porto Rico.
President and General Manager, F. W. Teele.

PORTSMOUTH STREET RAILROAD & LIGHT CO., Portsmouth, O.
Vice-President and General Manager, R. D. York.

POTTSVILLE UNION TRACTION CO., Pottsville, Pa.
Manager, W. B. Rockwell; Superintendent of Railways, C. F. Crane; Assistant Manager, V. D. Rickert.

POUGHKEEPSIE CITY & WAPPINGERS FALLS ELECTRIC RAILWAY CO., Poughkeepsie, N. Y.
Vice-President and General Manager, John L. Hinkley.

PUBLIC SERVICE CO. OF NORTHERN ILLINOIS, Streator, Ill.
General Superintendent, Geo. H. Lukes; Superintendent, J. M. Strassor.

PUBLIC SERVICE RAILWAY CO., Newark, N. J.
General Manager, R. E. Danforth; Superintendent of Transportation, N. W. Bolen; Assistant Superintendent of Transportation, J. W. Brown; Superintendent of Trucking, Daniel Beatty.

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PUEBLA TRAMWAY, LIGHT & POWER CO., Puebla, Pueb., Mex.
General Manager, J. C. Riach.

PUGET SOUND TRACTION, LIGHT & POWER COMPANY, BELLINGHAM DIVISION, Bellingham, Wash.
Manager, Leslie R. Coffin; Superintendent Railway Department, Geo. Hickok, Jr.

PUGET SOUND TRACTION, LIGHT & POWER CO., SEATTLE DIVISION, Seattle, Wash.
General Superintendent, A. L. Kempster; Assistant General Superintendent, G. B. Harrington; Superintendent Railways, G. A. Richardson.

QUEBEC RAILWAY LIGHT & POWER CO., Quebec, Canada.
General Manager, H. G. Matthews; Superintendent City Division, R. M. Reade; Superintendent Montmorency Division, J. A. Everell; General Freight and Passenger Agent, J. S. Blanchet; Kent House Manager, H. S. Knight.

QUINCY RAILWAY CO., Quincy, Ill.
General Manager, H. E. Chubbuck; General Superintendent, W. A. Martin; Superintendent Transportation, J. G. Forsthove.

RAPID TRANSIT RAILWAY CO., Dallas, Tex.
Manager, E. T. Moore; Superintendent, Richard Meriwether.

RHODE ISLAND CO. (THE), Providence, R. I.
General Manager, A. E. Potter; Superintendent Transportation, R. Roscoe Anderson.

RICHMOND & HENRICO RAILWAY CO., Richmond, Va.
General Superintendent and Chief Engineer, C. Sims Bailey.

RICHMOND & RAPPAHANNOCK RIVER RAILWAY CO., Richmond, Va.
President, Jos. B. Willard.

RICHMOND LIGHT & RAILROAD CO., New Brighton, N. Y.
Vice-President and General Manager, S. F. Hazelrigg; Superintendent Railroad Division, T. J. Mullen.

ROANOKE RAILWAY & ELECTRIC CO., Roanoke, Va.
General Manager, J. W. Hancock; Superintendent Railway Department, W. T. Bush.

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ROCKFORD & INTERURBAN RAILWAY CO., Rockford, Ill.
Treasurer and General Manager, W. C. Sparks; Superintendent, T. Eslinger; General Passenger and Freight Agent, C. C. Shockley.

ROCK ISLAND SOUTHERN RAILROAD CO., Monmouth, Ill
Secretary, General Manager and Purchasing Agent, W. W. McCullough; Assistant General Manager and General Freight and Passenger Agent, H. W. Stewart.

ROCKLAND, THOMASTON & CAMDEN STREET RAILWAY, Rockland, Me.
General Manager, Thomas Hawken; Superintendent, Valentine Chisholm.

RUTLAND RAILWAY, LIGHT & POWER CO., Rutland, Vt.
General Manager, I. M. Frost; Superintendent Transportation, A. E. Hewett.

SAGINAW & FLINT RAILWAY, Saginaw, Mich.
Superintendent, Charles Arnold.

SAGINAW-BAY CITY RAILWAY CO., Saginaw, Mich.
General Manager, J. A. Cleveland; Park Manager, L. H. Newcomb.

ST. FRANCOIS COUNTY RAILROAD CO., Farmington, Mo.
General Manager, A. D. Brinkerhoff, General Freight and Passenger Agent, F. V. Isenman.

ST. JOHNS RAILWAY CO. (THE), St. Johns, N. B.

ST. JOSEPH RAILWAY, LIGHT, HEAT & POWER CO., St. Joseph, Mo.
Vice-President and General Manager, J. H. Van Brunt; Superintendent of Transportation, O. L. Bocock.

SALT LAKE & OGDEN RY. CO., Salt Lake City, Utah.
President and General Manager, Simon Bamberger; General Freight and Passenger Agent, Ray B. Needham; Trainmaster, N. S. Wiltsie, Salt Lake City, Utah.

SAN ANTONIO TRACTION CO., San Antonio, Texas.
General Manager, E. E. Eysenbach; Superintendent of Transportation, T. C. Brown; Assistant Superintendent of Transportation, T. J. Owings.

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SAN DIEGO ELECTRIC RAILWAY CO., San Diego, Cal.

Vice-President and Managing Director, W. Clayton; General Superintendent, B. M. Warner; Superintendent, M. J. Perrin; Park Manager, John Davidson.

SAN FRANCISCO-OAKLAND TERMINAL RAILWAYS, Oakland, Cal.

Vice-President and General Manager, W .R. Alberger; Transportation Department — Assistant to General Manager, J. P. Potter; Superintendent of Transportation, E. E. Thornton; Assistant Superintendent, John S. Mills. Traction Division (formerly Oakland Traction Co., East Shore and Suburban Railway Co., and California Railway), Superintendent, Central District, A. H. A. Smith; Superintendent, Western District, H. Kelton; Superintendent, Eastern District, R. Hanson; Superintendent, Northern District, C. H. Robertson. Key Division (formerly San Francisco, Oakland and San José Consolidated Railway), Superintendent, Pier, C. A. Piper; Assistant Superintendent, H. T. Brobeck. Traffic Department — Industrial Agent, W. W. Keith; Soliciting Freight Agent, J. F. Lott.

SAN JOSE & SANTA CLARA COUNTY RAILROAD CO., San José, Cal.

Manager and Superintendent, F. E. Chapin.

SAO PAULO TRAMWAY, LIGHT & POWER CO., Sao Paulo, Brazil.

Manager, W. N. Walmsley.

SAVANNAH ELECTRIC CO., Savannah, Ga.

Manager, M. L. Sperry; General Superintendent, H. C. Foss; Superintendent of Transportation, R. D. Kernan.

SCHENECTADY RAILWAY CO., Schenectady, N. Y.

General Manager, James F. Hamilton; Superintendent of Transportation, W. S. Hamilton.

SCIOTO VALLEY TRACTION CO. (THE), Columbus, O.

President and General Manager, F. A. Davis; Superintendent, C. Skinner; General Freight Agent, J. O. Bradfield.

SCRANTON & BINGHAMTON TRACTION CO. (THE), Scranton, Pa.

General Manager, Rich. W. Day; Superintendent, Purchasing Agent and Chief Electrical Engineer, R. L. Kochler; Park Manager, C. H. Edwards.

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SCRANTON RAILWAY CO., Scranton, Pa.
General Manager, Frank Caum; Superintendent Transportation, P. T. Reilly.

SHAWNEE-TECUMSEH TRACTION CO., Shawnee, Okla.
President, General Manager and Treasurer, Willis E. Fertig; Superintendent, Purchasing Agent and Chief Engineer, O. H. Weddle.

SHEBOYGAN RAILWAY & ELECTRIC CO., Sheboygan, Wis.
President and General Manager, Ernest Gonzenbach; General Superintendent, Edward Hammett.

SHEFFIELD CO. (THE), Sheffield, Ala.
General Manager, H. B. Johnson.

SHORE LINE ELECTRIC RY. CO. (THE), Saybrook Junction, Conn.
General Manager, J. E. Sewell; General Superintendent and Superintendent Transportation, C. H. Welton.

SHREVEPORT TRACTION CO., Shreveport, La.
General Manager and Purchasing Agent, W. A. Sullivan; Superintendent, J. W. Robertson.

SIOUX CITY SERVICE CO., Sioux City, Ia.
General Manager, Edwin L. Kirk; Superintendent Transportation, H. Morrison.

SIOUX FALLS TRACTION SYSTEM, Sioux Falls, S. D.
President, Treasurer and General Manager, F. M. Mills; Superintendent and Assistant Secretary, James Brooks.

SOUTHEASTERN OHIO RAILWAY, LIGHT & POWER CO., Zanesville, O.
President and General Manager, W. A. Wilson; Secretary, Treasurer and Manager, Wm. H. Neikirk.

SOUTHERN RAILWAY & LIGHT CO., Natchez, Miss.
Secretary, Treasurer, General Manager and Purchasing Agent, Frank J. Duffy.

SOUTHERN WISCONSIN RAILWAY CO., Madison, Wis.
Vice-President, Dudley Montgomery.

SOUTHWEST MISSOURI RAILROAD CO., Webb City, Mo.
Superintendent Transportation, T. A. Harbaugh; General Superintendent and Mechanical Engineer, E. J. Pratt.

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SPARTANBURG RAILWAY, GAS & ELECTRIC CO., Spartanburg, S. C.

Vice-President and General Manager, F. H. Knox; Superintendent Railway, B. A. Buckheister.

SPRINGFIELD CONSOLIDATED RAILWAY CO., Springfield, Ill.

General Manager, A. A. Anderson; General Superintendent, A. D. Furlong; Claim Adjuster and Superintendent of Transportation, Joseph O'Hara.

SPRINGFIELD RAILWAY CO. (THE), Springfield, O.

General Manager, George C. Towle; Master Mechanic and Superintendent Transportation, E. B. Gunn.

SPRINGFIELD STREET RAILWAY CO., Springfield, Mass.

Vice-President and General Manager, H. C. Page; Manager, E. J. Dickson; Superintendent Transportation, George F. Reed; Superintendent Palmer Division, E. D. Atkins; Traffic Manager, C. V. Wood; Superintendent Westfield Division, V. F. Fabian.

SPRINGFIELD TRACTION CO., Springfield, Mo.

General Manager, Chas. H. Guckel; Superintendent, F. A. Gallagher.

SPRINGFIELD, TROY & PIQUA RAILWAY CO. (THE), Springfield, O.

Vice-President, General Manager and Claim Agent, F. J. Green; General Freight and Passenger Agent, J. M. Brick.

STERLING-DIXON & EASTERN ELECTRIC RAILWAY CO., Dixon, Ill.

Vice-President and General Manager, Frank J. Baker; General Superintendent, L. E. Marshall; District Superintendent, Dean Treat.

SUNBURY & SUSQUEHANNA RAILWAY CO., Sunbury, Pa.

Superintendent, P. H. Gentzel.

SYRACUSE & SUBURBAN RAILROAD CO., Syracuse, N. Y.

General Manager and Auditor, M. Badgero.

SYRACUSE, LAKE SHORE & NORTHERN RAILROAD CO., Syracuse, N. Y.

President and General Manager, C. D. Beebe; Operating Manager, W. C. Gray; General Passenger Agent, J. Stanley Moore; Traffic Manager, H. J. Clark.

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SYRACUSE RAPID TRANSIT RAILWAY CO., Syracuse, N. Y.
General Manager, B. E. Tilton; Superintendent Transportation, E. E. Strong; General Superintendent, J. E. Duffy.

TACOMA RAILWAY AND POWER CO., Tacoma, Wash.
General Managers, Stone & Webster Management Association; Manager, Louis H. Bean; General Superintendent, George W. Rounds.

TAMPA ELECTRIC CO., Tampa, Fla.
General Managers, Stone & Webster Management Association; Manager, J. C. Woodsome; Superintendent of Transportation, G. A. Webb.

TERRE HAUTE, INDIANAPOLIS & EASTERN TRACTION CO., Terre Haute, Ind.
President and General Manager, Robert I. Todd; General Superintendent, G. K. Jeffries; General Manager Terre Haute Division, T. F. Grover.

TEXARKANA GAS & ELECTRIC CO., Texarkana, Ark.
Secretary, Treasurer, General Manager and Purchasing Agent, W. L. Wood, Jr.; Superintendent Railway Department, H. L. Harris; Assistant Superintendent, W. M. Dunn.

TEXAS TRACTION CO., Dallas, Tex.
General Manager, R. B. Stichter; Superintendent, M. J. Loftus.

TIDEWATER POWER CO., Wilmington, N. C.
Manager, A. B. Skelding.

TOLEDO & CHICAGO INTERURBAN RAILWAY CO., Kendallville, Ind.
General Superintendent, C. J. Munton.

TOLEDO, BOWLING GREEN & SOUTHERN TRACTION CO., (THE), Findlay, O.
General Manager, Charles F. Smith; Traffic Manager, Charles J. Laney.

TOLEDO RAILWAYS & LIGHT CO. (THE), Toledo, O.
Manager Railway Department, J. M. Enright; General Passenger Agent, E. R. Kelsey.

TOPEKA RAILWAY CO. (THE), Topeka, Kan.
General Superintendent, A. M. Patten.

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TORONTO RAILWAY CO. (THE), Toronto, Ont.
General Manager, R. J. Fleming; Superintendent, James Gunn.

TORONTO SUBURBAN RAILWAY CO., Toronto, Ont.
General Manager and Purchasing Agent, G. C. Royce.

TRANS. ST. MARY'S TRACTION COMPANY, Sault Ste. Marie, Mich.
Vice-President and General Manager, W C.. Franz; Superintendent, D. F. Thomas.

TRENTON & MERCER COUNTY TRACTION CORPORATION, Trenton, N. J.
General Superintendent, J. C. Thompson.

TRI-CITY RAILWAY COMPANY, Davenport, Iowa.
Vice-President and General Manager, J. G. Huntoon.

TRINIDAD ELECTRIC TRANSMISSION RAILWAY & GAS CO. (THE), Trinidad, Colo.
General Manager, F. R. Woods.

TRI-STATE RAILWAY & ELECTRIC CO., East Liverpool, Ohio.
General Manager, W. R. W. Griffin.

TUCSON RAPID TRANSIT CO., Tucson, Ariz.
General Manager, F. E. Russell.

TULSA STREET RAILWAY CO., Tulsa, Okla.
President, General Manager and Purchasing Agent, C. H. Bosler; Superintendent and Park Manager, Morris McGrath.

TWIN CITY RAPID TRANSIT CO., Minneapolis, Minn.
General Manager, Horace Lowry; General Superintendent, J. J. Caufield; General Passenger Agent, A. W. Warnock; Park Superintendent, P. J. Metzdorf.

TWIN STATE GAS & ELECTRIC CO., Brattleboro, Vt.
President and General Manager, I. L. Meloon; Manager Brattleboro Division, E. M. Addis.

UNION ELECTRIC CO., Dubuque, Ia.
Manager, E. M. Walker; Superintendent, A. H. Smith.

UNION LIGHT & POWER CO., Junction City, Kan.
President and General Manager, John T. Dalton; Superintendent, W. E. Sweezey.

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THE UNITED ELECTRIC TRAMWAYS OF MONTEVIDEO, Ltd., London, E. C.

Managing Director of La Sociedad Commercial de Montevideo, Senor Don Juan Cat.

UNION STREET RAILWAY CO., New Bedford, Mass.

General Superintendent, Elton S. Wilde.

UNION TRACTION COMPANY OF INDIANA, Anderson, Ind.

General Manager, H. A. Nicholl; General Passenger and Freight Agent, F. D. Norviel; Superintendent of Transportation, C. A. Baldwin.

UNITED RAILROADS OF SAN FRANCISCO, San Francisco, Cal.

Vice-President and General Manager, Charles N. Black; General Superintendent, E. D. Hibbs; Division Superintendent, J. N. Nougues.

UNITED RAILWAYS & ELECTRIC COMPANY OF BALTIMORE (THE), Baltimore, Md.

Vice-President and General Manager, T. A. Cross; Assistant General Manager, James R. Pratt; Superintendent of Transportation, W. C. Ludwig.

UNITED RAILWAYS COMPANY OF ST. LOUIS, St. Louis, Mo.

President, General Manager and Purchasing Agent, Robert McCulloch; Vice-President and Assistant General Manager, Richard McCulloch; Superintendent Transportation, Bruce Cameron.

UNITED TRACTION COMPANY, Albany, N. Y.

General Manager, James F. Hamilton; Assistant General Manager, Chas. H. Smith; General Superintendent, Arnold von Schrenk; Traffic Manager, C. H. Armatage.

UTAH LIGHT & RAILWAY CO., Salt Lake City, Utah.

General Manager, J. S. Wells.

UTICA & MOHAWK VALLEY RAILWAY CO., Utica, N. Y.

General Superintendent, J. E. Duffy; General Express Agent, F. W. Watts; General Passenger Agent, C. R. Gowen.

VALLEY TRACTION CO., Lemoyne, Pa.

President and Superintendent, C. H. Bishop.

VICKSBURG LIGHT & TRACTION CO., Vicksburg, Miss.

General Manager, W. B. Moorman.

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VIRGINIA RAILWAY & POWER COMPANY, Richmond Va.
General Manager, C. B. Buchanan; Assistant General Manager, E. C. Hathaway; Assistant General Manager, C. C. Johnson.

WALLA WALLA VALLEY RAILWAY CO., Walla Walla, Wash.
Vice-President and General Manager, C. S. Walters.

WARREN & JAMESTOWN STREET RAILWAY CO., Warren, Pa.
President and General Manager, David H. Siggins; Secretary, Superintendent and Purchasing Agent, Sam Q. Smith.

WASHINGTON, BALTIMORE & ANNAPOLIS ELECTRIC RAILROAD CO., Baltimore, Md.
General Manager, J. J. Doyle.

WASHINGTON & OLD DOMINION RAILWAY (THE), Washington, D. C.
General Manager, W. B. Emmert; General Freight and Passenger Agent, J. V. Davis.

WASHINGTON RAILWAY & ELECTRIC CO., Washington, D. C.
Superintendent Transportation, J. T. Moffett.

WASHINGTON-VIRGINIA RAILWAY CO., Washington, D. C.
General Manager, R. W. King; Secretary, Assistant General Manager and Purchasing Agent, J. B. Hoellman; Superintendent, P. E. Clift.

WASHINGTON WATER POWER CO. (THE), Spokane, Wash.
General Manager, C. S. MacCalla; Superintendent Railways, R. A. Willson.

WATERLOO, CEDAR FALLS & NORTHERN RAILWAY CO., Waterloo, Ia.
General Manager, C. D. Cass; Superintendent, O. S. Lamb; General Freight and Passenger Agent, C. M. Cheney.

WAUPACA ELECTRIC LIGHT & RAILWAY CO., Waupaca, Wis.
President, General Manager and Purchasing Agent, Irving P. Lord.

WAYCROSS STREET & SUBURBAN RY. CO., Waycross, Ga.
Superintendent, A. B. Coryell.

WEST CHESTER STREET RAILWAY CO., West Chester, Pa.
Superintendent, Thos. F. Miley.

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WEST PENN TRACTION & WATER POWER COMPANY, Pittsburgh, Pa.

General Superintendent, Frank McCoy, Tarentum, Pa.; Starter, Geo. Allen.

WESTSIDE ELECTRIC STREET RAILWAY CO., Charleroi, Pa.

General Manager, D. G. Callihan.

WESTERN NEW YORK & PENNSYLVANIA TRACTION CO., Olean, N. Y.

General Manager, I. W. Miller; General Freight and Passenger Agent and Park Manager, W. P. Bailey; Division Superintendent, J. T. Wheeler; Division Superintendent, A. C. Sloan.

WHEELING TRACTION CO., Wheeling, W. Va.

General Manager, G. O. Nagle; Superintendent Transportation, C. M. Marsh.

WILKES-BARRE & HAZLETON RAILROAD CO., Hazleton, Pa.

Vice-President and General Manager, C. B. Houck; Superintendent of Transportation, A. F. Harger.

WILKES-BARRE RAILWAY CO., Wilkes-Barre, Pa.

Vice-President, Manager and Purchasing Agent, T. A. Wright; Superintendent of Transportation, Edward G. Ervin.

WILLAPA HARBOR RAILWAY COMPANY, Raymond, Wash.

Manager, R. L. Fisher.

WILLIAMSPORT PASSENGER RAILWAY CO., Williamsport, Pa.

Secretary, Treasurer and General Manager, Ernest H. Davis; Superintendent of Transportation, W. H. Dougherty.

WILMINGTON & PHILADELPHIA TRACTION CO., Wilmington, Del.

Manager, William A. Heindle; Superintendent of Transportation, W. H. Hitchcock.

WINDSOR, ESSEX & LAKE SHORE RAPID RAILWAY CO., Kingsville, Ont.

General Manager, Purchasing Agent and Park Manager, A. Eastman; Superintendent, A. W. Westman; Traffic Manager, E. S. Hughes.

WINNIPEG ELECTRIC RAILWAY CO., Winnipeg, Manitoba.

General Manager and Chief Engineer, Wilford Phillips.

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WINONA RAILWAY & LIGHT COMPANY, Winona, Minn.
General Manager, R. M. Howard; Superintendent of Transportation, W. G. Lyons.

WISCONSIN PUBLIC SERVICE COMPANY, Green Bay, Wis.
Superintendent Railway Department, A. T. Bushong.

WISCONSIN TRACTION, LIGHT, HEAT & POWER CO., Appleton, Wis.
General Manager, John I. Beggs; General Superintendent, A. K. Ellis.

WOODLAWN & SOUTHERN STREET RAILWAY CO., Pittsburgh, Pa.
Superintendent, J. H. Gano.

WORCESTER CONSOLIDATED STREET RAILWAY CO., Worcester, Mass.
General Manager, H. C. Page.

YAKIMA VALLEY TRANSPORTATION CO., North Yakima, Wash.
Superintendent, W. C. Baker.

YORK RAILWAYS CO., York, Pa.
President and General Manager, Gordon Campbell; Superintendent of Transportation, J. E. Wayne.

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MEMBERS (INDIVIDUAL)

(Arranged According to States)

ALABAMA

MONTGOMERY:

Mathes, L. D., General Manager and Purchasing Agent, Montgomery Light & Traction Co.

ARIZONA

PHOENIX:

Mitchell, S. H., Manager, Phoenix Railway Co.

ARKANSAS

FORT SMITH:

McCarthy, P. O., Superintendent Transportation, Fort Smith Light & Traction Co.

LITTLE ROCK:

Griffith, C. J., General Manager, Little Rock Railway & Electric Co.

TEXARKANA:

Harris, H. L., Superintendent Railway Department, Texarkana Gas & Electric Co., 116 East Broad Street.

CALIFORNIA

LOS ANGELES:

Burnett, C. H., Manager, Outside Operation Pacific Electric Railway Co., Pacific Electric Building.

OAKLAND:

Potter, J. P., Assistant to General Manager, San Francisco–Oakland Terminal Railways, 310 Syndicate Building.

Mills, John J., Assistant Superintendent, San Francisco–Oakland Terminal Railways, 308 Syndicate Building.

Thornton, E. E., Superintendent Transportation, San Francisco–Oakland Terminal Railways, 970 33rd Street.

PETALUMA:

Van Frank, E. M., President, Petaluma & Santa Rosa Railway Co.

SAN FRANCISCO:

Hibbs, E. D., General Superintendent, United Railroads of San Francisco, 85 Second Street.

Nougues, J. M., Division Superintendent, United Railroads of San Francisco.

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COLORADO

DENVER:

Adam, James C., Motorman, The Denver City Tramway Co., 382 South Broadway.

Adams, James L., Division Superintendent, The Denver City Tramway Co., 3035 Perry Street.

Carter, B. H., Inspector, The Denver City Tramway Co., 1637 Franklin Street.

Casey, D. F., Conductor, The Denver City Tramway Co., 2537 West 33rd Avenue.

Casey, W. M., Trainmaster, The Denver City Tramway Co.

Chilberg, J., Manager Sales, The Colorado Fuel & Iron Co.

Cox, J. H., Inspector, The Denver City Tramway Co., 3065 Gilpin Street.

Davidson, H. W., Clerk, The Denver City Tramway Co., 382 South Pennsylvania Street.

Eckland, E. T., Inspector, The Denver City Tramway Co., 2340 South Acoma.

Harvey, Robert E., Publicity Agent, The Denver City Tramway Co.

Johnson, E. S., Conductor, The Denver City Tramway Co., 2537 West Thirty-third Avenue.

Jackson, R. W., Conductor, The Denver City Tramway Co., 374 South Pennsylvania Street.

Love, W. W., Motorman, The Denver City Tramway Co., 832 Thirteenth Street.

McKie, Wm. H., Conductor, The Denver City Tramway Co., 1671 South Grant Street.

Neighbor, Elmer W., Motorman, The Denver City Tramway Co., 624 West Second Avenue.

Nesbit, Edw. M., Conductor, The Denver City Tramway Co., 1836 East 38th Avenue.

Perriam, Sam. J., Dispatcher, The Denver City Tramway Co., 4585 Vrain Street.

Port, C. C., Division Superintendent, The Denver City Tramway Co., 2837 Gilpin Street.

Rice, G. L., Superintendent Southern Division, The Denver City Tramway Co.

Ryan, M. M., Conductor, The Denver City Tramway Co., 2913 Larimer Street.

Seip, W. H., Superintendent Central Division, The Denver City Tramway Co.

Swift, Chas. A., Instructor, The Denver City Tramway Co., 2608 Dunkeld Place.

Topping, Thos. W., Conductor, The Denver City Tramway Co., 3433 Gilpin Street.

Wales, B. H., Inspector, The Denver City Tramway Co., 3336 Hayward Place.

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DENVER — *Continued.*

Waller, O. A., Roadway Officer, The Denver City Tramway Co., 31 West Bayand Street.

Wells, Chas. B., Superintendent Transportation, The Denver City Tramway Co.

Williams, H. R., Motorman, The Denver City Tramway Co., 300 Inca Street.

CONNECTICUT

HARTFORD:

Goodrich, E. S., Hartford.

DISTRICT OF COLUMBIA

WASHINGTON:

Eddy, H. C., Executive Officer, Interstate Commerce Commission.

Moffett, J. T., Superintendent Transportation, Washington Railway & Electric Co., Fourteenth & East Capitol Streets.

Morrill, F., Roadmaster, The Capital Traction Co.

FLORIDA

KEY WEST:

Grooms, B. L., Superintendent Railway, Key West Electric Co.

GEORGIA

ATLANTA:

Hurt, Joel, Equitable Building.

SAVANNAH:

Kernan, R. D., Superintendent of Transportation, Savannah Electric Co.

ILLINOIS

CHICAGO:

Diehl, P. H., District Manager, Railway Audit & Inspection Co., 115 South La Salle Street.

Feron, M. J., Superintendent of Transportation, Metropolitan West Side Elevated Railway, 421 Marshfield Avenue.

Manzer, C. R., Chief Clerk, Chicago City Railway Co.

Pratt, Geo. W., Chicago City Railway Co., 15 Scott Street.

Spangler, G. M., Jr., Manager, Chicago Association of Commerce, Otis Building.

Sullivan, Joseph V., General Supervisor, Chicago Railways Co., 1165 North Clark Street.

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Thomas, L., Resident Manager, General Railway Signal Co., 1248 Peoples Gas Building.

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CHICAGO HEIGHTS:

Murphy, J. T., Superintendent, Chicago Heights Street Railway Co.

EAST ST. LOUIS:

Purinton, A. J., General Superintendent, East St. Louis & Suburban Railway Co.

GALESBURG:

Bogges, S. E., General Superintendent, People's Traction Co.

Nelson, Edw. H., Superintendent Railway, Galesburg Railway & Light Co.

HIGHWOOD:

Bock, E. J., General Superintendent, Chicago & Milwaukee Electric Railroad Co.

PITTSFIELD:

Crawford, J. B., General Superintendent (District G), Central Illinois Public Service Co.

INDIANA

ANDERSON:

Baldwin, Chas. A., Superintendant Transportation, Union Traction Company of Indiana.

EVANSVILLE:

Muhlhausen, Gus, General Manager, Evansville, Suburban & Newburgh Railway Co.

Shipherd, L. C., Superintendent, Evansville & Southern Indiana Traction Co.

FORT WAYNE:

Palmer, C. E., Superintendent Transportation, Fort Wayne & Northern Indiana Traction Co.

INDIANAPOLIS:

Mahoney, John J., Superintendent, Indianapolis Traction & Terminal Co., Indianapolis.

SOUTH BEND:

Emmons, C. D., General Manager, Chicago, South Bend & Indiana Railroad Co.

IOWA

DAVENPORT:

Crafts, P. P., General Manager, Iowa & Illinois Railway Co.

KANSAS

WICHITA:

Bell, Chas. D., General Superintendent, Arkansas Valley Interurban Railway Co.

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KENTUCKY

LEXINGTON:

Bacon, F. W., Vice-President, Kentucky Traction & Terminal Co.

LOUISIANA

NEW ORLEANS:

Dressel, Harry J., Superintendent, New Orleans Railway & Light Co., 323 Barrow Street.

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Hegarty, D. A., Manager, New Orleans Railway & Light Co.

Winters, F. L., Assistant Superintendent, New Orleans Railway & Light Co., 323 Baronne Street.

MAINE

PRESQUE ISLE:

Dingwall, M. S. W., Superintendent, Aroostook Valley Railroad Co.

MARYLAND

ANNAPOLIS:

Arnold, A. S., General Passenger and Freight Agent, The Maryland Electric Railways.

Cherry, T. C., General Manager, The Maryland Electric Railways.

Heyward, J. F., Vice-President and General Manager, The Maryland Electric Railways.

BALTIMORE:

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Cross, Thomas A., General Manager, The United Railways & Electric Company of Baltimore.

Ludwig, W. C., Superintendent of Transportation, The United Railways & Electric Company of Baltimore.

Wehr, A. H., Lawyer, Vice-President and General Manager, Baltimore County Water & Electric Co.

FROSTBURG:

Taylor, John E., Superintendent, Cumberland & Westernport Electric Railway Co.

MASSACHUSETTS

AUBURNDALE:

Sullivan, James W., Superintendent Division 2, Middlesex & Boston Street Railway Co.

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BOSTON:

Barnes, Karl S., Superintendent Division 2, Boston Elevated Railway Co.

Brush, M. C., 2d Vice-President, Boston Elevated Railway Co.

Connell, Timothy, Time-Table Clerk, Boston Elevated Railway Co.

Curtin, David, Roadmaster, Bay State Street Railway Co., 84 State Street.

Faulkner, H. A., Secretary, New England Street Railway Club, 12 Pearl Street.

Learned, C. E., Superintendent of Inspection, Boston Elevated Railway Co.

Potter, E. E., Stone & Webster.

Rand Avery Supply Co., Federal Street.

Rollins, J. W., Jr., President, Holbrook, Cabot & Rollins Co., 6 Beacon Street.

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Stone & Webster Management Association, 147 Milk Street.

Wilkins, Frank I., Division Superintendent, Boston Elevated Railway Co.

BROCKTON:

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Dumford, Geo., General Express and Freight Agent, Bay State Street Railway Co.

CANTON:

Buchanan, Frank T., Superintendent, The Blue Hill Street Railway Co.

Spaulding, G., General Foreman, The Blue Hill Street Railway Co.

LOWELL:

Farrington, H. E., Superintendent, Bay State Street Railway Co.

Lees, Thomas, Superintendent, Bay State Street Railway Co.

NORTHAMPTON:

Clark, Edwin C., Superintendent, Northampton Street Railway Co.

SOUTH FRAMINGHAM:

Shaw, E. P., Jr., General Manager, Boston & Worcester Street Railway Co.

TAUNTON:

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WORCESTER:

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Page, H. C., General Manager, Worcester Consolidated Street Railway Co.

MICHIGAN

BENTON HARBOR:

Bean, W. Worth.

DETROIT:

Brooks, F. W., General Manager, Detroit United Railway.

Bullen, Harry, General Superintendent, Detroit United Railway.

Parker, G. W., General Express and Freight Agent, Detroit United Railway.

JACKSON:

Morgan, C. E., General Superintendent, Michigan United Traction Co.

MISSISSIPPI

GULFPORT:

Gorenflo, W. F., General Manager, Gulfport & Mississippi Traction Co.

MERIDIAN:

McArthur, I. H., Superintendent, Meridian Light & Railway Co.

Paterson, A. B., General Manager, Meridian Light & Railway Co.

MISSOURI

CAPE GIRARDEAU:

Barnes, Samuel, General Manager, Cape Girardeau–Jackson Interurban Railway Co.

KANSAS CITY:

Frick, H. C., President and General Manager, National Railway Training Association, Dwight Building.

Holmes, Walton H., President, Pioneer Trust Co.

ST. JOSEPH:

Bocock, O. F., Superintendent Transportation, St. Joseph Railway, Light, Heat & Power Co., 424 Edmond Street.

ST. LOUIS:

Cameron, Bruce, Superintendent, United Railways Company of St. Louis.

WEBB CITY:

Pratt, E. J., General Superintendent, Southwest Missouri Railroad Co.

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MONTANA

ANACONDA:

Clinton, F. H., Superintendent of Electric Light and Railway Department, Anaconda Copper Mining Co.

NEVADA

RENO:

Hark, Geo. W., Superintendent, Reno Traction Co.

NEW HAMPSHIRE

MANCHESTER:

Hunt, Sam. P., Assistant General Manager, Manchester Traction, Light & Power Co.

NEW JERSEY

ATLANTIC CITY:

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BAYONNE:

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CAMDEN:

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Bolton, Geo. W., Starter, Public Service Railway Co., 706 New Street.

Brown, C. D., Dispatcher, Public Service Railway Co., 1111 Carpenter Street.

Bullock, A., Station Master, Public Service Railway Co., 626 Line Street.

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Jolly, Geo., Receiver, Public Service Railway Co., 497 Newton Avenue.

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King, J. A., Inspector, Public Service Railway Co., 567 Clinton Street.

Lippincott, R. B., Instructor, Public Service Railway Co., 118 South 32nd Street.

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CAMDEN — *Continued.*

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DUNELLEN:

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EAST ORANGE:

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McArthur, R. A., Supervisor, Public Service Railway Co., 92 Hollywood Avenue.

Peirce, Wm. C., Supervisor, Public Service Railway Co., 12 Ninth Avenue.

Pratt, A. W., Supervisor, Public Service Railway Co., 26 William Street.

Valentine, H., Supervisor, Public Service Railway Co., 93 Elmwood Avenue.

EDGEWATER:

Baurhenn, L. P., Division Superintendent, Public Service Railway Co.

Branagan, C. T., Pilot, Riverside & Fort Lee Ferry Co.

Derfus, Geo., Collector, Riverside & Fort Lee Ferry Co.

Graham, Henry F., Pilot, Riverside & Fort Lee Ferry Co.

Horing, J. N., Pilot, Riverside & Fort Lee Ferry Co.

Larson, C. O., Receiver and Time Keeper, Riverside & Fort Lee Ferry Co.

Logan, M. R., Pilot, Riverside & Fort Lee Ferry Co.

McCabe, J. J., Pilot, Riverside & Fort Lee Ferry Co.

Tracy, Geo., Pilot, Riverside & Fort Lee Ferry Co.

Van Name, E., Capt., Superintendent of Ferries, Riverside & Fort Lee Ferry Co.

ELIZABETH:

Gettings, J. J., Division Superintendent, Public Service Railway Co., 865 Livingston Street.

Southard, F. C., Supervisor, Public Service Railway Co., 865 Livingston Street.

HARRISON:

Riordan, John F., Jr., Station Master, Public Service Railway Co., 311 North Fourth Street.

HOBOKEN:

McHugh, T. A., Clerk, General Manager's Office, Public Service Railway Co., 366 Fourth Street.

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HOBOKEN — *Continued.*

Trainer, M. N., Assistant Instructor, Public Service Railway Co., Hoboken Car House.

IRVINGTON:

Turner, A., Station Master, Public Service Railway Co., 51 Olympia Terrace.

Wild, Jacob, Inspector, Public Service Railway Co., 462 Grove Street.

JERSEY CITY:

Bachman, C. F., Station Master, Public Service Railway Co., 560 Mercer Street.

Beatty, Daniel, Superintendent of Trucking, Public Service Railway Co., 691 Montgomery Street.

Bliss, A. J., Supervisor, Public Service Railway Co., 155 Bay View Avenue.

Brown, Wm., Clerk in Emergency Department, Public Service Railway Co., 115 Magnolia Avenue.

Budenbender, Wm. C., Chief Clerk Traction Department, Hudson Division, Public Service Railway Co., 29 Exchange Place.

Carey, John, Receiver, Public Service Railway Co., 433 Jersey Avenue.

Conway, John, Starter, Public Service Railway Co., 387 Baldwin Avenue.

Donlin, J. F., Supervisor, Public Service Railway Co., 24 Huron Avenue.

Keefer, Jos. F., Assistant Station Master, Public Service Railway Co., 79 Seaview Avenue.

Leahy, Chas. P., Car Timer, Public Service Railway Co., 183 Monticello Avenue.

McCarthy, Lawrence, Inspector, Public Service Railway Co., 118 Ocean Avenue.

Miller, A. F., Clerk Employment Department, Public Service Railway Co., 86 Wayne Street.

Newton, Geo. J., Clerk Purchasing Department, Public Service Railway Co., 238 Fourth Street.

Sinnott, S., Station Clerk, Public Service Railway Co., 63 Ocean Avenue.

Williams, E. L., Division Superintendent, Public Service Railway Co., 29 Exchange Place.

Williams, R. T., Assistant Supervisor, Public Service Railway Co., 521 Jackson Avenue.

Wilson, Thos., Inspector, Public Service Railway Co., 158 Armstrong Avenue.

MONTCLAIR:

Darlington, Arthur, Station Master, Public Service Railway Co., 12 Cross Street.

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MORRISTOWN:

Choate, J. K., General Manager, Morris County Traction Co.

NEWARK:

Allen, W. C., Supervisor, Public Service Railway Co., 116 4th Street.

Baumann, Chas. A., Assistant Division Superintendent, Public Service Railway Co., 230 6th Avenue.

Betts, Philander, Chief Inspector Utilities Division, Public Utilities Commission.

Bolen, N. W., Superintendent Transportation, Public Service Railway Co.

Bollenbach, E. V., Clerk, Public Service Railway Co., 54 Fabyan Place.

Brown J. W., Assistant Superintendent Transportation, Public Service Railway Co.

Buckman, A. R., Assistant Real Estate Agent., Public Service Railway Co.

Bush, Herman D., Station Master, Public Service Railway Co., 79 N. 13th Street.

Christiansen, G., Supervisor, Public Service Railway Co., 72 Springfield Avenue.

Coe, C. H., Chief Instructor, Public Service Railway Co., Miller Street Car House.

Conlon, O. N., Clerk, Public Service Railway Co.

Conway, H. E., Time-Table Clerk, Public Service Railway Co.

Dougherty, James, Inspector, Public Service Railway Co., 625 Ferry Street.

Downs, J. L., Chief Clerk Time-Table Department, Public Service Railway Co., Public Service Building.

Ford, H. K., Engineer, Real Estate Department, Public Service Railway Co., Room 810, Public Service Building.

Graham, W. B., Division Superintendent, Public Service Railway Co.

Hallock, K. M., Secretary to President, Public Service Railway Co.

Healy, J. F., Instructor, Public Service Railway Co., 16 Bergen Street.

Hornig, E. F., Conductor, Public Service Railway Co., 311 West Kinney Street.

Ingalls, Percy, General Agent, Public Service Railway Co.

Ingham, W. B., Inspector of Traffic, Public Utilities Commission, 738 Broad Street.

Jackson, A. Superintendent of Time-Table, Public Service Railway Co.

Keller, John, Assistant Superintendent, Public Service Railway Co., 306 So. 7th Street.

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NEWARK — *Continued.*

Kershaw, Jos., Inspector, Public Service Railway Co., 415 South 10th Street.

Kieferdorf, F., Clerk, Employment Department, Public Service Railway Co.

Lake, A. S., Public Service Railway Co.

Lindner, Frank, Station Master, Public Service Railway Co., 99 Wakeman Avenue.

McClane, W. N., Superintendent Inspectors, Public Service Railway Co.

MacFayden, J., Investigator, Public Service Railway Co.

Moore, C. F., Clerk, General Manager's Office, Public Service Railway Co., 181 North 7th Street.

Moore, Jos. H., Inspector, Public Service Railway Co. 386 Sanford Avenue.

Mullen, E. A., Inspector, Public Service Railway Co., 310 Hillside Avenue.

Nicholas, Jas., Supervisor, Public Service Railway Co., 520 So. 11th Street.

Orts, J. M., Assistant Chief Instructor, Public Service Railway Co.

O'Toole, John L., Publicity Agent, Public Service Railway Co.

Pierson, P. W., Secretary to General Manager, Public Service Railway Co.

Preuster, W. G., Car Timer, Public Service Railway Co.

Ramsey, W. J., Superintendent of Employment, Public Service Railway Co.

Rielly, J., Clerk, Manager Office, Public Service Railway Co., 389 Warren Street.

Sexton, Jos., Clerk Track Department, Public Service Railway Co.

Shepherd, W. H., Chief Clerk Time-Table Department, Public Service Railway Co.

Sparrow, Clar., Station Master, Public Service Railway Co. Bergen Avenue Car House.

Sparrow, J. F., Supervisor, Public Service Railway Co., 229 Clifton Avenue.

Sturm, J. F., Supervisor, Public Service Railway Co., 896 South 18th Street.

Torbert, J. T., Supervisor, Public Service Railway Co.

NEW BRUNSWICK:

Burke, T. P., Supervisor, Public Service Railway Co., 127 Albany Street.

NORTH BERGEN:

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ORANGE:

Quale, John T., Inspector, Public Service Railway Co.

PATERSON:

Cameron, J. R., Inspector, Public Service Railway Co., 18 Smith Street.

Dougherty, P. K., Starter, Public Service Railway Co., 17 North West Street.

Engle, J. L., Station Master, Public Service Railway Co., 484 East 18th Street.

Haselmann, E., Inspector, Public Service Railway Co., 95 21st Avenue.

Mattimore, E., Supervisor, Public Service Railway Co., 207 Pacific Street.

Schimpf, J. Herbert, Division Superintendent's Clerk, Public Service Railway Co.

Smith, O. E., Inspector, Public Service Railway Co., 202 Preakness Avenue.

Stone, Geo., Division Superintendent, Public Service Railway Co.

Suter, John, Inspector, Public Service Railway Co., 49 Cliff Street.

RIDGEWOOD:

Durbin, F. M.

RIVERSIDE:

Counselman, L. W., Superintendent, Riverside Traction Co.

TRENTON:

Titus, W. E., Superintendent, Elizabeth & Trenton Railroad Co.

UNION HILL:

Dubelbeiss, Wm., Inspector, Public Service Railway Co., 207 4th Street.

WASHINGTON:

Petty, R. M., President, Northampton, Easton & Washington Traction Co.

WEST COLLINGSWOOD:

Gearly, Leighton K., Station Manager, Public Service Railway Co., 619 Eldridge Avenue.

WEST HOBOKEN:

Brady, Thos. J., Junior Clerk Track Department, Public Service Railway Co., 318 Traphagen Street.

Gleason, Wm. J., Station Master, Public Service Railway Co.

McCullough, A. P., Supervisor, Public Service Railway Co., 511 Palisade Avenue.

Maass, Walter K., Station Clerk, Public Service Railway Co.

Reis, R. W., Inspector, Public Service Railway Co., 452 Summit Avenue.

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WEST HOBOKEN — *Continued.*

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Weiss, John, Starter, Public Service Railway Co.

Wilmott, Chas., Assistant Supervisor, Public Service Railway Co.

WEST NEW YORK:

Guenther, Wm., Station Master, Public Service Railway Co.

WOODLYNNE:

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NEW YORK

BABYLON, L. I.:

Nyegaard, H., Superintendent, Babylon Railroad Company.

BROOKLYN:

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Bongard, Herman, Assistant Superintendent, Brooklyn Rapid Transit System, Bergen Street Depot.

Burke, D. H., Station Master, Brooklyn Rapid Transit System, New Lots Road and Rockaway Avenue.

Bush, F., Assistant Superintendent, Transit Development Co., Canarsie Depot.

Cooney, J. E., Depot Master, Transit Development Co., New Lots Road and Rockaway Avenue.

Cordery, F. P., Assistant Superintendent, Brooklyn Rapid Transit System, 23rd Street Depot.

Cornell, M. S., Assistant Superintendent, Brooklyn Rapid Transit System, 3024 Clarendon Road.

Crossman, T. E., 931 73rd Street.

Dean, Homer C., Night Depot Master, Brooklyn Rapid Transit System, 584 Leonard Street.

Donohue, Thos. J., Depot Master, Brooklyn Rapid Transit System, Bergen Street Depot.

Drew, Chas. A., Depot Master, Brooklyn Rapid Transit System, 131 Moffat Street.

Gilchrist, E., Assistant Superintendent, Brooklyn Rapid Transit System., 570 Clinton Street.

Glover, Wm. J., Depot Master, Brooklyn Rapid Transit System, 481 Grove Street.

Hogberg, C., Assistant Superintendent, Brooklyn Rapid Transit System, 120 Miller Avenue.

Kuefner, Jos., Depot Master, Brooklyn Rapid Transit System, 67 Russell Street.

Kueny, E. A., Depot Master, Brooklyn Rapid Transit System, 23rd St. Depot.

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Mellen, B. F., 389 State Street.

Mooney, John, Depot Master, Brooklyn Rapid Transit System, 918 East 32nd Street.

Mueller, H., Assistant Superintendent, Brooklyn Rapid Transit System, 628 East 28th Street.

O'Keefe, Frank, Assistant Superintendent, Brooklyn Rapid Transit System, Palmeth Street and Myrtle Avenue.

Roe, C. W., Assistant Superintendent, Brooklyn Rapid Transit System, Crosstown Shops.

Roome, Wm. J., Depot Master, Brooklyn Rapid Transit System, 397 5th Street.

Siebert, Wm., Superintendent Surface Lines., Brooklyn Rapid Transit System.

Smith, D. P., Depot Master, Brooklyn Rapid Transit System, 160 Saratoga Avenue.

Watson, Z. E., Secretary and Treasurer, The Brooklyn City Railroad Co.

Weigel, J., Chief of Time-Table Department, Brooklyn Rapid Transit System, 85 Clinton Street.

Williams, J. O., Depot Master, Brooklyn Rapid Transit System, 353 Grove Street.

BUFFALO:

Connette, E. G., General Manager, International Railway Co.

Paine, F. B. H., General Manager, Niagara, Lockport & Ontario Power Co.

Northrup, Wm. P., Vice-President, The Matthews-Northrup Works, 177–185 Washington Street.

Wilson, T. W., 548 Franklin Street.

COOPERSTOWN:

Mower, S. W., General Manager, Otsego & Herkimer Railroad Co.

CORTLAND:

Duffey, Edwin, Treasurer and Manager, Cortland County Traction Co.

DEPEW:

Mooney, John T., Superintendent, Buffalo & Depew Railway Co.

ELMHURST:

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LONG ISLAND CITY:

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MASPETH:

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NEW BRIGHTON:

Mullen, T. J., Superintendent, Richmond Light & Railroad Co.

NEW YORK:

Blake, Henry W., Editor, Electric Railway Journal, 239 West 39th Street.

Coleman, J. J., 230 Ft. Washington Avenue.

Delaney, T. A., Supervisor Transportation, New York Railways Co., 775 7th Avenue.

Doran, James J., Chief Clerk, Employment Bureau, Public Service Railway Co., 578 East 163rd Street.

Douds, H. J., Commercial Engineer, J. G. White & Co., 43 Exchange Place.

Haag, F. E., Auditor, Walbridge & Co., 7 Wall Street.

Hazleton, Hugh, Electrical Engineer, 100 Broadway.

Keegan, Geo., Superintendent Transportation, New York City Railways Co., 165 Broadway.

Lackey, J. B., Street Railways Advertising Co., Fuller Building.

Lane, F. Van Z., Assistant Engineer, Traction Department of Public Works, 1421 Park Row.

Meade, R. W., President and General Manager, New York Transportation Co., Aeolian Building.

Munger, E. T., General Superintendent, Hudson & Manhattan Railroad Co., 30 Church Street.

O'Rourke, J. F., Superintendent Transportation, Hudson & Manhattan Railroad Co., 137 Christopher Street.

Palmer, L. H., with Harrison Williams, 60 Broadway.

Pierce, D. T., McGraw Publishing Co., 239 W. 39th Street.

Saxby, Lewis, Advertising Department, Hudson & Manhattan Railroad Co., 30 Church Street.

Smith, S. D., Superintendent Manhattan Railway Division, Interborough Rapid Transit Co., 217 West 105th Street.

Weaver, H. B., General Manager, Receiver of South Shore Traction Co., 165 Broadway.

Wisch, P. Edward, President, P. Edward Wisch Service Co., 171 Broadway.

Wood, F. T., Assistant to General Manager, New York Railways Co., 621 Broadway.

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PORT RICHMOND:

Brown, Geo. R., Receiver, Port Richmond & Bergen Point Ferry Co.

Bunn, Wm. J., Pilot, Port Richmond & Bergen Point Ferry Co.

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PORT RICHMOND — *Continued.*

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ROCHESTER:

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SCHENECTADY:

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SYRACUSE:

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Dyer, R. A., Jr., Assistant General Manager, Rochester, Syracuse & Eastern Railroad Co.

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Strong, E. E., Superintendent Transportation, Syracuse Rapid Transit Railway Co.

UTICA:

Gowen, C. R., General Passenger Agent, Utica & Mohawk Valley Railway Co.

McEwen, I. H., Superintendent, Oneida Railway Co.

Watts, F. W., General Express Agent, Utica & Mohawk Valley Railway Co.

NORTH CAROLINA

ASHEVILLE:

White, E. P., Superintendent of Transportation, Asheville Power & Light Co.

OHIO

CLEVELAND:

Hyman, Edgar H., General Manager, Electric Package Agency.

Radcliffe, G. L., General Manager, The Cleveland Railway Co.

LIMA:

Carpenter, F. D., General Manager, The Western Ohio Railway Co.

MANSFIELD:

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OKLAHOMA

ENID:

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OKLAHOMA CITY:

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